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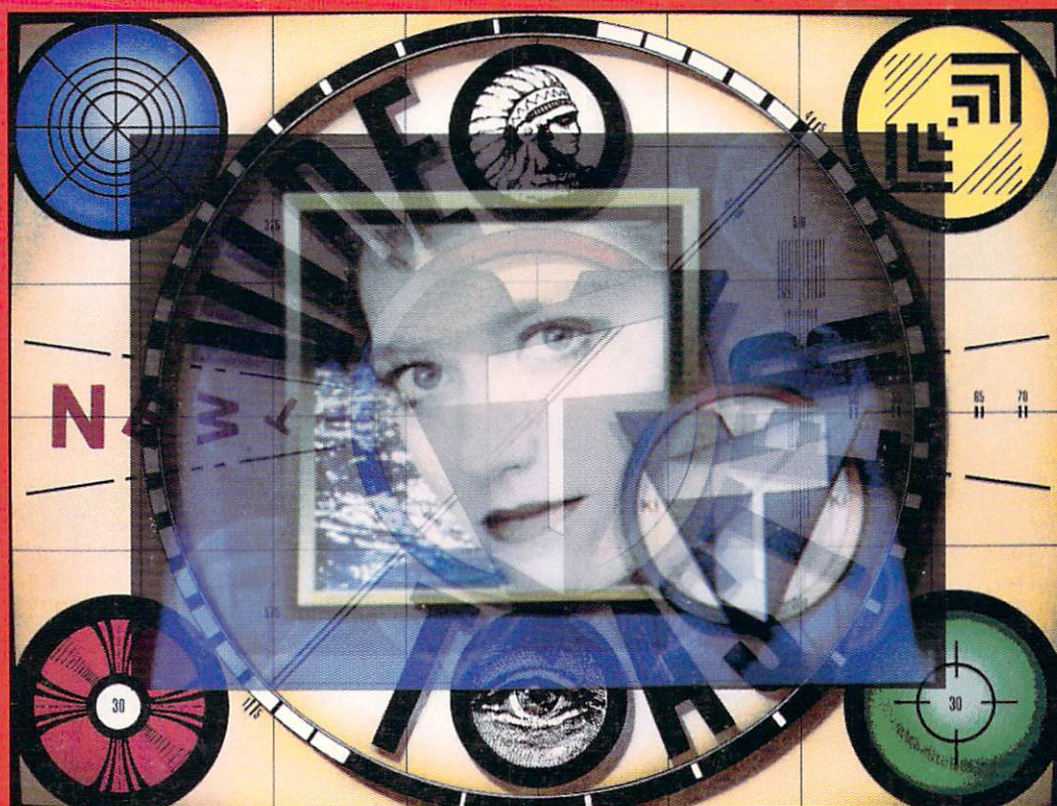
Your Original AMIGA® Monthly Resource

For The Commodore

AMIGA®

Volume 6 No. 3 March 1991
US \$3.95 Canada \$4.95

NewTek's Video Toaster!



Reviews:

- Quarterback Tools, Macro Paint & more

Plus!

- Ultrasonic Ranging System Hardware Project
- CES: Worldwide CDTV Introduction
- Fred Fish Collection Hits 450



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Ernest P. Viveiros, Sr.

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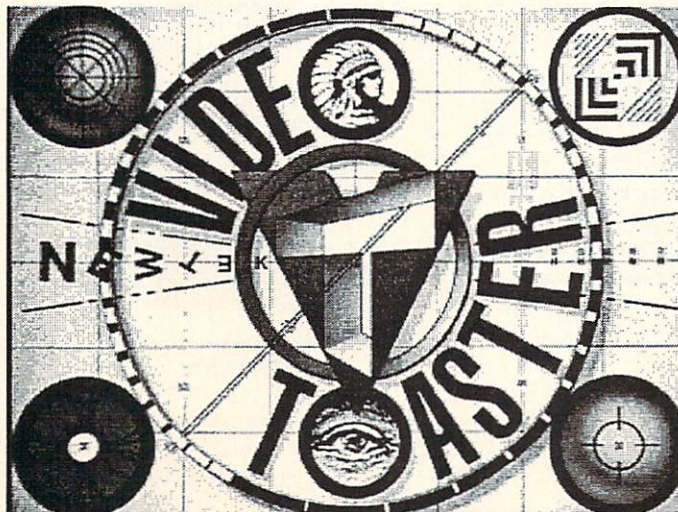
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EDITORIAL CONTENT

NewTek's Video Toaster And So Much More

The Toaster

It's here! Well, actually NewTek's Video Toaster has been out and available in quantity for the last few months. So you may wonder why *Amazing Computing* has waited until now to present an article on a piece of hardware that has been considered by some industry observers to be the supreme Amiga application.

AC has always maintained that only final release products will be reviewed. The Video Toaster has been shipping with gamma release (pre-final) software. After waiting several months for NewTek to supply us with a final version of the Video Toaster for review, we procured a gamma release model for our Video Consultant, Frank McMahon, and he began the review process. Why did we review the product at that stage? If a gamma release product is made available and is being sold to the public, it is our obligation to review the product as is.

Nevertheless, as this issue neared deadline, NewTek released the final software (V1.0) along with a new manual. Mark Randall of NewTek was instrumental in providing us with the updated software and manual, but it was NewTek's founder, Tim Jenison, who provided a complete Video Toaster, software, and manual for any last-minute corrections and background.

A Long Time Coming

Most Amiga fans have been hearing about the Toaster for years. From whispers first presented in AC's "Roomers" column to NewTek presentations at Amiga trade shows, the Toaster became the most anticipated hardware item in the Amiga market. It even beat CBM's Amiga 3000. By most accounts, the Video Toaster took about three years to get from the first hints of its existence to market. Three long years.

Few of us can imagine the incredible strain that Tim Jenison and his team must have been under as they worked to complete the Toaster. From fears of high RAM prices to the problem of a changing Amiga platform (NewTek introduced the Video Toaster hardware in its final preproduction form at the same time that CBM introduced the newly designed Amiga 3000), NewTek not only had to deal with the difficulties of developing a "TV station-on-a-card", but they had to defend the Toaster's tardiness.

During the final stages of NewTek's efforts, I traveled to Topeka to view their work firsthand (see the May 1990 issue). The people of NewTek had completed their initial tasks and were certain the final product would be shipping in six weeks. It did take longer, but in the meantime they demonstrated the Toaster to broadcasters, cable operators, and video technicians. The Toaster received recognition and awards at every show.

With all this behind NewTek, the Video Toaster is more popular than ever. Stories are appearing in PC and Mac magazines, and the Toaster has even been displayed at MacWorld. In his review, Frank attempts to unravel the mystery of the Toaster to demonstrate what it can (and cannot) do for us all.

The More

Although the Toaster article comprises a rather large portion of this issue, there are other areas you do not want to miss. In "And Furthermore" (page 96), there is news of GVP's announcing their first software product, SCALA. This European presentation package is about the easiest Amiga package to use we have seen thus far.

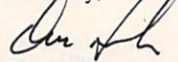
Also in "And Furthermore", we discovered Commodore's new "Gold Service" program for the Amiga 2000, 2000HD, 2500, and 3000-series computers. These "Professional Systems" will be backed with a free one-year, on-site warranty if purchased after February 1, 1991 and activated through an Authorized Commodore Reseller.

On page 22, R. Shamms Mortier reviews Impulse's Imagine package. As he writes, "This is truly a piece of software that allows you to get to what the Amiga does best—creative work."

There is also information from CES and Commodore's worldwide introduction of CDTV as well. (Yes, CDTV has even more features and software titles).

In truth, this has been one of the most demanding issues we have ever created. It is everything that we set out to create: it is a magazine we would want to read. Enjoy.

Sincerely,



Don Hicks
Managing Editor

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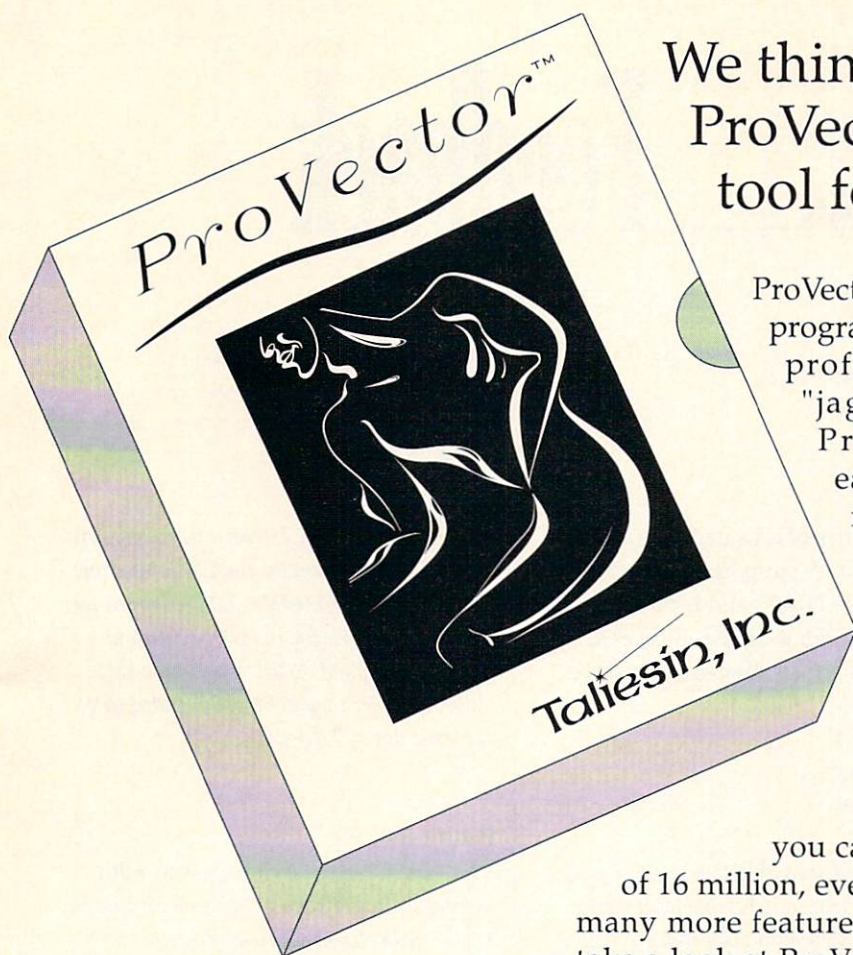
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We think you'll find that ProVector is an indispensable tool for any Amiga artist.

ProVector is a fast, intuitive object-oriented drawing program for all Amiga models. ProVector is a true professional illustration tool which allows "jaggy-free" device-independent output. ProVector offers a complete array of easy-to-use tools to provide a surprisingly natural feel to creating professional quality illustrations on the Amiga.

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Feedback

RECURSION OR REPETITION?

This letter is in regards to the article titled "Programming in AmigaBASIC: The Shotgun Approach Revisited". I question Mr. Morrison's use of the word "recursion" to describe his programming examples. I do believe that there is some confusion as to whether he means recursion in the classic computer science sense or he is describing repetition.

Recursion, in the classic sense, is a function which calls itself, not a series of repeated steps. Although they are similar, recursion and repetition are markedly different.

Recursion, for example, can be an operation such as traversing a binary tree, or generating the Fibonacci sequence. Or, as in the following example, $N!$ (N factorial).

Example. (pseudo code)

```
function factorial(n)
    if (n=1) then return 1
    else
        result = n * factorial(n-1)
        return result
    end if
```

I'm certainly not trying to detract from this fine article; I just question Mr. Morrison's use of terms. Recursion, in a true computer science sense, is not

merely a series of repeated steps. Many languages don't support recursion (i.e., COBOL, FORTRAN, and most forms of BASIC). Though it can be simulated, recursion is not an inherent part of the language.

Tony Kennedy
Reading, PA

—We received several letters regarding Mr. Morrison's error in using the term *recursion* instead of *iteration* (repetition). Please look at Mr. Morrison's article this month for an apology.—Ed.

KICKSTART 1.3

Are you aware of any programs (in Fred Fish maybe) that will read the ROMs in a 500/2000/3000 and create a Kickstart disk for a 1000? This seems like it would be a simple program. I am still using 1.2 because I cannot find a Kickstart 1.3, despite all my friends with 1.3 ROMs.

Also, do you know if the new 2.0 will be available on a Kickstart disk or if it will even work without ECS? I have had my 1000 since 1985 and would like to keep it alive and kicking.

Jon Loschke
Gainesville, FL

—First, Commodore is planning to have an AmigaDOS solution for the 1000 sometime in the future. Meanwhile, 2.0 is planned for immediate release for the 500, 2000, and 3000. Yes, 2.0 will work without the ECS chips, however they are recommended to get the most out of 2.0.—Ed.

Black Holes

I have been playing around with various Mandelbrot programs and have found that MandelVroom found on FF 215 is a really powerful and versatile program. So much for the plug. Now, I read somewhere recently about someone exploring the Mandelbrot set and "discovering black holes". Can you explain what is meant by this? You have been especially helpful in answering questions in the past and I hope you can answer this one.

For the uninitiated, using such programs can give you really interesting and beautiful graphics. I recommend you try some out.

C. A. Barringer
Crescent City, FL

—We asked Paul Castonguay, a contributing author of *Amazing Computing*, to help us answer this question.

"Black Hole" is the name given to a certain pattern found as one explores the

(continued on page 16)



NEW!

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Trumpcard Professional is a new generation SCSI controller card for the new generation of 20 Megabit per second drives. While Trumpcard Professional is incredibly fast with drives of any speed, its performance is unmatched with the new generation drives, up to an unprecedented 1.9 MEGABYTES per second with DPERF2! Trumpcard Professional is state of

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by John Rezendes

The Hills Are Alive ...

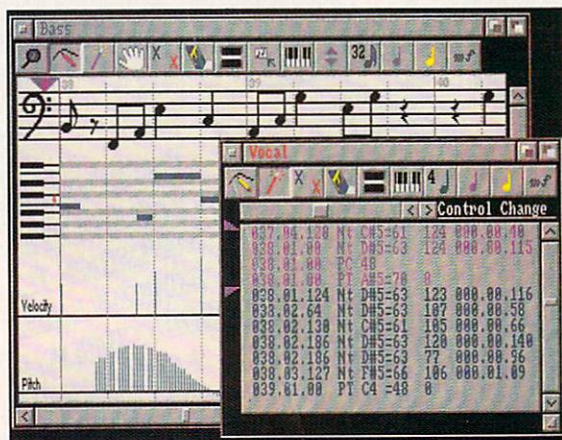
The Blue Ribbon SoundWorks, Ltd. has reduced the price of its music software package, **Bars&Pipes**. At press time, it lists for \$299.00 but as of February 14, 1991 Bars&Pipes will sell for \$199.00. Blue Ribbon hopes this price reduction will prompt more entry level users and hobbyists to experience and explore Bars&Pipes' approach to music composition.

Concurrent with this price reduction is Blue Ribbon's release of a yet

Capabilities include global clipboard editing, cut, paste, mix, copy, toolize, punch in/out, loop, mark, and time shift. Advanced composition enhancing, editing, arranging, mixing, and syncing in Bars&Pipes Professional extend the creative possibilities and level of productivity available to today's Amiga musician. All registered Bars&Pipes users can upgrade for \$99.00. *Bars&Pipes*, price: \$199.00; *Bars&Pipes Professional*, price: \$379.00. The Blue Ribbon SoundWorks, Ltd., 1293 Briardale NE, Atlanta, GA 30306, (404) 377-1514. Inquiry #218.

Some Things Just Get Better

Progressive Peripherals & Software has expanded the power and versatility of **3-D Professional** by releasing an advanced ray tracing software module. As it interfaces directly to the original program, this new module can be put to use quickly and easily, and is available free of charge to current 3-D Pro users. The module will be included in future releases at no extra charge. The 3-D Professional ray tracing system produces umbras and penumbras capable of rendering fuzzy shadows, blurred transparencies, reflections and refractions, giving more realism to 3-D objects. User-adjustable settings—such as variable rates of antialiasing, definable screen regions, image sizing, and number of rays per pixel—are also available. All ray tracing features are accessible through a single screen, point-and-click interface. The 3-D Professional ray tracing system includes



Bars&Pipes Professional

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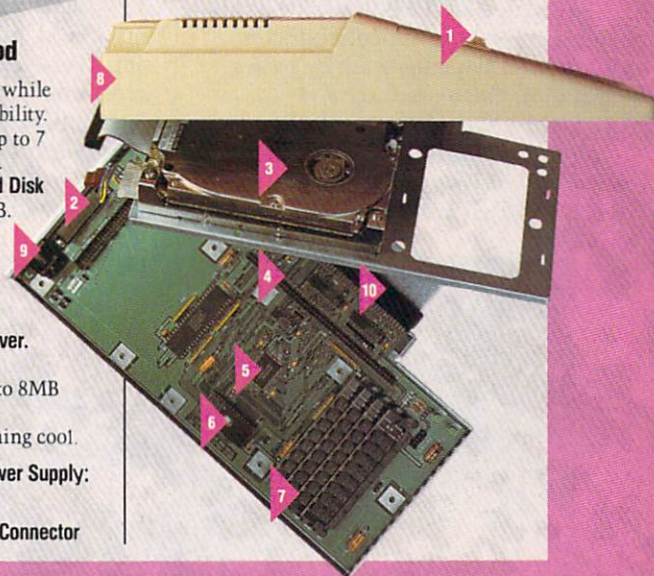
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software and a comprehensive manual. *Progressive Peripherals & Software*, 464 Kalamath Street, Denver, CO 80204, (303) 825-4144. Inquiry #222.

Capital Video?

Digital Creations has released DCTV, its new video display and digitizing system for the Amiga. Using the Amiga chip memory as its frame buffer memory, DCTV creates a full-color NTSC display with all the color and resolution of television. DCTV works with all popular 3-D programs in creating animations which can be played back in real time. Other features include display and capture of full-color, 24-bit, high-resolution images, the ability to capture a video frame from any color video camera in 10 seconds, and the ability to convert DCTV images to or from any IFF display format. Paint, digitize, and conversion software are all included and 1MB is required. DCTV, price: \$495.00. Digital Creations, 2865 Sunrise Boulevard Suite 103, Rancho Cordova, CA 95742, (916) 344-4825. Inquiry #217.

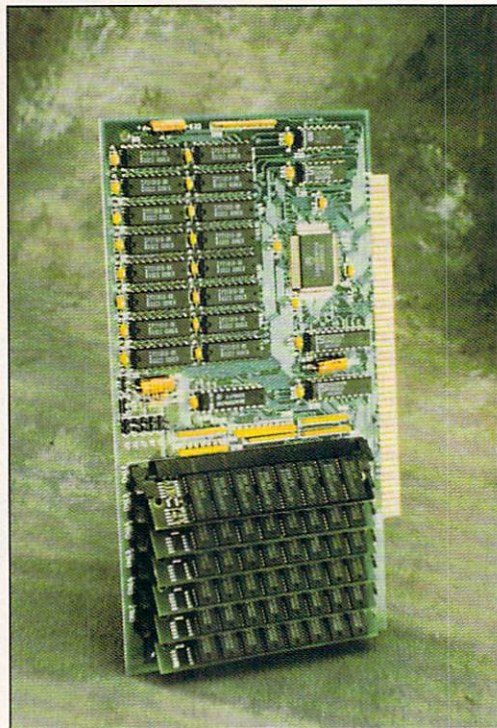
Don't Judge This Book By Its Cover!

Windcrest by TAB BOOKS has just published *Desktop Video Production*, an insightful 196-page work by professional film/video producer and Amigaphile Michael Brown. Brown examines how state-of-the-art video technology has combined with the most recent developments in personal

computing to make possible the desktop production of broadcast-quality animated film shorts, homemade music videos, presentation graphics, corporate promotional and training films, television commercials, and more. Hardware, software, utilities, and the expansion capabilities of "The Renegade Microcomputers" (as Brown affectionately refers to the Amiga and Macintosh lines in his opening chapter) as pertains to desktop video production are covered. Helpful descriptions of the complete range of cameras, camcorders, videotape recorders, edit controllers, video digitizers, sound recorders, and synthesizers are also presented, as is production guidance in planning, budgeting, blocking, rehearsing, lighting, and editing. Amiga lovers, don't be fooled by this book's cover (an Apple Computer is pictured); our favorite computer gets equal—if not top—billing! *Desktop Video Production*, price: \$16.95 U.S., \$22.95 Canadian. TAB BOOKS, Blue Ridge Summit, PA 17294-0850, (800) 822-8138. Inquiry #219.

It's Gr-r-r-eat!

Great Valley Products has just introduced its Series II RAM Expansion Board for the Amiga 2000. The Expansion Board comes with 2MB of auto-configured RAM, expandable to 8MB. It also supports a 6MB configuration for maximum memory utilization for Commodore's A2088/2286 Bridge-



Series II RAM Expansion Board

board users. *Series II RAM Expansion Board*, price: \$249.00. Great Valley Products, 600 Clark Avenue, King of Prussia, PA 19406, (215) 337-8770. Inquiry #227.

The Latest Craze & Those Good Old Games

Merit Software has two new releases this month, *Teenage Mutant Ninja Turtles* and *Classic Board Games*.

That's right—America's favorite "Heroes In A Half Shell" have come to the Amiga, in the form of an entertaining electronic crayon game. Contained in this deluxe computer coloring book are thirty Ninja Turtle pictures which can be colored and then printed as custom banners, calendars, pictures, and personalized stories. This program also serves as a helpful educational tool in providing children with interesting descriptions of each stop on the musical Ninja Turtles' current "World Tour".

Classic Board Games features new twists on three standards: chess, checkers, and backgammon. Each of the games in this package can be played at three difficulty levels; a player may play against the computer or against another player on that computer, or against a



DCTV

The Best Assembler Macro68

Suggested retail price: US\$150

Macro68 is a powerful new assembler for the entire line of Amiga personal computers.

Macro68 supports the entire Motorola M68000 Family including the MC68030 and MC68040 CPUs, MC68882 FPU and MC68851 MMU. The Amiga Copper is supported also.

This fast, multi-pass assembler supports *both* the *old* and *new* Motorola M68000 Family assembly language syntax, and comes with a utility to convert old-style syntax source code painlessly. The new syntax was developed by Motorola specifically to support the addressing capabilities of the new generation of CPUs.

Macro68 boasts macro power unparalleled in products of this class. There are many new and innovative assembler directives. For instance, a special structure offset directive assures maximum compatibility with the Amiga's interface conventions. A user-accessible file provides the ability to customize directives and run-time messages from the assembler. An AREXX(tm) interface provides "real-time" communication with the editor of your choice. A number of directives enable **Macro68** to communicate with AmigaDos(tm).

Possibly the most unique feature of **Macro68** is the use of a shared-library, which allows *resident* preassembled include files for incredibly fast assemblies.

Macro68 is compatible with the directives used by most popular assemblers. Output file formats include executable object, linkable object, binary image, and Motorola S records.

Requires at least
1 meg of memory.

ReSource,
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"If you're serious about disassembling code, look no further!"

The original **ReSource** continues to be available for owners of 68000 based machines.
Both versions of **ReSource** require at least 1 meg of ram.
Suggested retail prices: Original **ReSource**, US\$95, **ReSource'030**, US\$150

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remote computer via a modem. *Teenage Mutant Ninja Turtles*, price: \$19.95, Inquiry #220; *Classic Board Games*, price: \$29.95, Inquiry #221. Merit Software, 13635 Gamma Road, Dallas, TX 75244, (214) 385-2353.

Other Things Get Better, Too

As of February 1st, registered owners of versions of **Soft-Logik Corporation's PageStream** prior to **PageStream 2** (version 2.1) must pay \$100.00—up from \$75.00—to upgrade to the latest releases of the professional desktop publishing package.

The present upgrade includes support for AGFA Compugraphic's Intellifont hinted out-line font technology, a full set of 4 program disks, a completely new manual, and more. *Soft-Logik Corporation*, 11131 S. Towne Square, Suite F, St. Louis, MO 63123, 1-800-829-8608. Inquiry #223.

Pirates Beware!

Practical Solutions, Inc. has announced the release of **Safekey**, a new innovation in copy-protection technology. An advanced command set allows more sophisticated encoding, which provides a higher level of security on all computers using a standard RS232 port. With **Safekey**, all communications are handled by the operating system, making hardware differences between host systems inconsequential. **Safekey** does not interfere with the ability to make backups or in hard drive installation, and allows other serial devices to connect via its pass-through port. Depending on the sophistication of the system, the user has the choice of three models. The copy protection features can be implemented so the application executes only with a **Safekey** connected. *Safekey*, models priced from \$29.00 to \$49.00. *Practical Solutions*, 1135 N. Jones Blvd., Tucson, AZ 85716, (602) 322-6100. Inquiry #224.

SpeakerSimphony

dissidents has released version 2.1 of **SpeakerSim**, the only professional-level loudspeaker CAD program available for the Amiga. **SpeakerSim** allows hobbyists, designers, and

enthusiasts to create or optimize loudspeaker systems using either sealed or rented system models. Release 2.1 extends the power of this package in a number of different ways. First, you may send plots to any HP7475-type plotter, PostScript laser printer, Epson HI-80 plotter, or Preferences-supported printer using either a serial or parallel interface. This allows users to continue to work with **SpeakerSim** while the plot is being produced. Second, **SpeakerSim** now features an extensive **ARexx** interface, allowing it to be used as a calculation engine because virtually every aspect of **SpeakerSim** can be controlled via **ARexx**. This includes all attributes and system parameters, as well as the ability to load and save configuration, macro, driver data, and IFF-ILBM files. Finally, **SpeakerSim** now includes ten programmable **ARexx** macro keys which can be used to launch **ARexx** scripts. These scripts can be used to control other **ARexx** programs or **SpeakerSim** itself. Registered users may upgrade to version 2.1 for \$5. *SpeakerSim*, price: \$112. *dissidents*, 730 Dawes Avenue, Utica, New York 13502, (315) 797-0343. Inquiry #225.

What Is An Extremely Helpful Video Pavilion?

Future Touch has announced shipment of **The Presentor**, a fully integrated multimedia kiosk. The **Presentor's** components include: a 16MHz, 32-bit CPU with 5MB RAM, a 50MB hard disk, an internal genlock, a 19-inch color touch-screen monitor, a coupon dispenser, a laser disc player, a video- and color-calibration system, and a development package that includes authoring software, a paint program, and a titling program. The key component is the laser disc player driver, which enables the use of a low-cost laser player and cuts cost without impacting performance. The **Presentor** is targeted to both VARs and end users since it can be easily configured in a variety of ways to suit a wide range of applications. **Future Touch** will customize **The Presentor** to meet VAR and end-user requirements. *The Presentor*, price: \$6,600.00. *Future Touch*, 192 Laurel Road, East Northport, NY 11731, (516) 757-7334. Inquiry #226.

CORRECTIONS!

It has been brought to our attention that the following error appeared in AC V5.12, December 1990:

In a paragraph on NEC's new PC-VCR in the Roomers column, beginning in the third line down from the top of page 63, **The Bandito** states, "It offers single-frame accuracy for about \$2,000."

Actually, the product offers single-frame accuracy in the search function, but not in the edit function.

In the Fall/Winter '90-'91 *AC's GUIDE To The Commodore Amiga*, an incorrect address was given for **SportTime Computer Software** on page 316. The correct address is: **SportTime Computer Software**, 3941-E South Bristol Street Suite 551, Santa Ana, CA 92704, (714) 966-0207 or (800) 752-9426.

We would also like to note the following changes to information provided on **SportTime** products in that same issue. On page 108, the price given for **College League Option Module** was \$19.95; the actual price is \$14.95. On page 129, the price given for **Side-View Game Module** was \$19.95; the actual price is \$14.95. On page 131, the price given for **Stable Owners Option Module** was \$19.95; the actual price is \$14.95. On page 118, the price given for **Jockey Competition** was \$19.95; again, the actual cost is \$14.95.

Finally, two additional products from **SportTime** should have been listed in the Fall/Winter '90-'91 *AC's GUIDE*:

Track 2 works with any **Horse Racing Module**, with all-new animation and 128 new horses. List price is \$14.95.

Track Designer allows you to break away from traditional oval tracks by creating an unlimited variety of race tracks of varying shapes, distances, and difficulty. It comes with its own track player so that you can use your newly created tracks with any **Horse Racing Module**. Includes "saddle" 3-D graphics so you can experience each race from the horse's back. List price is \$14.95.

We apologize for these errors, and hope that no major inconveniences resulted. We hope that these corrections are found to be helpful.—Ed.

•AC•

A less expensive alternative for
Amiga 1000 and 500 owners:

Spirit Technology's HDA-506

by Mike C. Corbett

Amiga 1000 owners tend to be an adventurous lot. Either we bought a new computer that was untried in the marketplace, or we bought one knowing it had been orphaned. No matter what the situation, we have lived with the fear that support would some day dry up completely. And compared to owners of higher priced machines, we also tend to want more economical hardware expansion for our systems. This is doubly true with hard drives, which tend to be the most expensive add-on a person will buy. In light of this, Spirit Technology has produced the HDA-506 interface for the Amiga 1000 and 500 computers. This system allows you to use the less expensive ST-506 interface hard drives that are so popular in the IBM PC world.

At this point a little explanation is in order. ST-506 is a standard interface by which the computer communicates with the hard drive. This standard is most popular on the IBM PC and its compatibles. There are other standards, the most common in the Amiga community being SCSI (pronounced "scuzzy"), which stands for Small Computer Systems Interface. The major problem with SCSI interface drives is their cost. They are more expensive (per megabyte) than the ST-506 drives that are manufactured in much greater volume. A typical 40 megabyte SCSI drive will normally cost about \$100 more than a 40 megabyte ST-506 drive.

Another important thing to know is that there are two standard methods of encoding data (the way it is physically written to the disk), called MFM and RLL. MFM is the more common and older of the two methods. RLL was devised as a way to squeeze more data into the same amount of space, giving about a 45% improvement in the amount of data that can be written onto any given MFM disk. Because RLL gets more into the same space it will also provide an equivalent increase in data transfer speed.

SCSI does have advantages over ST-506, the most important one being transfer speed. A SCSI drive can typically move data between itself and the computer at least two times faster than a comparable ST-506 drive. However, as stated before, they are more expensive and for many of us the jump in speed and capacity from floppy drives to the ST-506 hard drive is more than enough to take our breath away. The system tested for this review has shown a peak transfer rate of about 310,000 bytes per second as measured by the Dperf2 program. A typical SCSI disk will do over 600,000 bytes per second and an Amiga floppy drive can transfer about 12,000 bytes per second.

The HDA-506 system includes everything you need except the hard drive itself. The best way to set up your system is to acquire your hard drive first and then order the appropriate HDA-506 system, accounting for MFM or RLL encoding. This is important to know when talking to Spirit Technology because a disk that is certified for MFM only will not work reliably with an RLL controller. An MFM controller will work with an RLL drive, but then

your nice 40 meg drive will suddenly become your not as nice 32 meg drive. The drive tested with this system is a 42 megabyte KPTI model PT351 from JB Technologies. When ordering be sure to specify the OMTI brand controller. The alternate controller Spirit ships is a DTC brand. I first received the DTC controller and found its performance to be unacceptably slow, making my hard disk into little more than a very large floppy. This slowness is caused by the read/write head being stepped (moved) 1 cylinder at a time, instead of being positioned directly to the needed

The HDA-506 system is a good way for owners of Amiga 1000 and 500 computers to get a reliable and inexpensive hard drive system.

position. Stopping at each track can take a long time when the hard drive has over 800 cylinders.

I also recommend purchasing the autoboot option with the system. This allows the computer to boot Workbench from the hard drive, and at \$30 it is money well spent to ban the Workbench floppy from your system. The HDA-506 system consists of an enclosure for your hard drive, the HDA-506 interface, an ST-506 controller, the enclosure for the electronics which fits on the expansion port on the side of the machine, the cables that connect the controller with the drive, and a software disk.

Assembly of the system does not require a lot of technical knowledge, but if this is your first project then you may want to get the help of a more experienced friend. The installation manual is well thought out and detailed enough to enable almost anyone to just follow the steps for assembly.

Once the system is put together you are ready to turn the system on and begin the software portion of the setup. For

Amiga 1000 owners, assuming everything was put together properly, you should see the hand and disk screen asking for the Kickstart disk as usual. The HDA-506 software disk is then inserted at the Workbench prompt. Before the drive can actually be used it must first be prepared by performing a low level format and then an AmigaDOS format. The low level format is the procedure that defines the physical location of where the data will be placed on your drive. This is done by the supplied HDFormat program.

This is where I have my first gripe. In the IBM world, most low level programs available will allow you to enter any known bad blocks before performing the low level format. This allows the disk controller to "map out" or make unavailable any areas that you know about at the lowest level. It is common for even a brand new hard drive to have a few imperfections and it is useful to be able to tell the computer about them before it tries to use them. Having this capability would result in an improvement in overall reliability of the system as a whole. Spirit has tried to address this problem by allowing the HDFormat program to perform a verification on the disk after the low level format has been done. However, the verification process does not always catch weak spots that look good for a short time after the low level format but decay into unreliability after a few hours. This is a problem that should be addressed in a future revision of the HDFormat program.

Once the low level format is completed the high level or AmigaDOS format must be performed. In order to do this we come up against the second problem I have with this product. In order for the Amiga to address any device, said device must have an appropriate entry in the system "MountList" file.

In the latest version of their software Spirit Technology has provided a program to assist in the creation of this "MountList" entry, but I found the software cumbersome and difficult to use. There was too much difficulty in determining if a proper entry had been created and there was no confirmation when the new entry was added to the "MountList" file.

If the Autoboot option has been purchased there is one step left to perform. The script "ABootInstall" is executed from the Shell (CLI) which installs the necessary system files onto a small partition on the hard drive. This small partition is necessary because the Amiga must be able to read in the device driver files before it can understand anything other than the standard file structure of a normal AmigaDOS disk. A device driver is really a program that tells the computer how to "talk" to a piece of hardware. Without these device drivers the Amiga only knows how to read the standard AmigaDOS file format.

Almost inevitably, as a hard drive ages some areas will become unusable. Because of this Spirit has included a program "MapBad" to scan a hard drive partition and mark any new bad blocks as unavailable. This is an invaluable program since it prevents data loss by not allowing anything to be placed on those bad areas; no hard drive system should be without its equivalent. It is a good idea to run this program periodically just to help make sure that you don't get a nasty surprise someday.

The HDA-506 system is a good way for owners of Amiga 1000 and 500 computers to get a reliable and inexpensive hard drive system. Any questions that arose during setup were quickly dealt with by their technical support staff. Although there exists some room for improvement in the installation software, Spirit Technology has produced another piece of hardware worthy of your attention. •AC•

HDA-506
Price: \$399.00
Inquiry #210
Spirit Technology
220 West 2950 South
Salt Lake City, UT 84115
(800) 433-7572

KPTI hard drives
PT338 32.1 MB MFM: \$225.00
PT351 42.8 MB MFM: \$239.00
PT357R 49.1 MB RLL: \$259.00
PT376R 65.5 MB RLL: \$299.00
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JB Technologies, Inc.
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Trumpcard 500 expansion cards are the same cards sold by IVS for the A2000 and the A3000. The ultra reliable *Trumpcard* SCSI disk controller, *Trumpcard Professional*, the ultimate high performance SCSI disk controller, and *Meta4*, a 512k - 4M fast RAM expansion card, all work flawlessly in the Trumpcard 500 expansion chassis. So when you upgrade to an A2000, 2500, or 3000, just pull the cards from the Trumpcard 500 chassis and plug them into the new computer. No problems, no sweat, no charge. It's that simple.

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(Feedback, continued from page 6)

Mandelbrot set. By exploring we mean selecting different coordinates and magnifications.

These "Black Holes", when found, appear to have no end when magnification is increased, thus giving an endless spiral effect.

The term "Black Hole" is not officially recognized by mathematicians, but is a term that hobbyists have given to these interesting patterns.

To find a "Black Hole", try these coordinates:

real coordinate .3395

imaginary coordinate -.0510 .

I'M IMPRESSED!

First, I would like to thank you for providing the Amiga community with an excellent magazine. You do a fine job of covering everything there is to cover. Let's face it, with the Amiga being able to do almost everything, it takes quite a bit of work for you to cover it all as well.

Second, I am impressed by the article in the May issue, "Do It By Remote". This is something that I have always wanted to try, perhaps because I have read too many science fiction books. Not having much experience in electronics, I was greatly pleased to find out that the author, Andre Theberge, was providing some assistance in the way of parts. Only, how am I to get in touch with him? No where in his article, nor in the follow-up letter in the August issue, was an address given for him. Nor was it mentioned that we could write him through you, which I am now attempting (I hope). Could you please either forward his address to me, or even mine to him.

Alton Deslandes
Ontario, Canada

—You may contact Andre Theberge or any author by sending a letter to their attention in c/o Amazing Computing.—Ed.

HOMEMADE STARTUP-SEQUENCE

I recently bought an autobooting hard drive for my older A500, forgetting one important fact. While I waited for my 1.3 ROM to arrive, I developed the following boot-disk startup-sequence to reduce boot time as much as possible. Perhaps it might be useful to others with non-autobooting HDs.

```
SetPatch >NIL: r
FastMemFirst
BindDrivers
defdisk dh0: ;defdisk is a PD program
              ;that reassigns the system
              ;disk and relevant
              ;directories to the
              ;specified device. This
              ;can also be done by
              ;ASSIGNing sys:, C:,
              ;devs:, libs:, fonts:, L:,
              ;and S: to the device
              ;directories. These
              ;directories, of course,
              ;must exist on the device
              ;and contain the files
              ;necessary to your
              ;startup.
runback c:execute dh0:s/startup-sequence
              ;This turns over the
              ;startup procedure to the
              ;startup-sequence on your
              ;HD, which should contain
              ;the rest of your usual
              ;startup commands. Be sure
              ;to change all path
              ;references in dh0:s/
              ;startup-sequence so the
              ;system references files
              ;on your HD.
endcli >nil:
```

It's not autobooting, but it saves about two-thirds of my startup time compared to booting exclusively off a floppy. The longer your startup-sequence, the greater the savings.

Gerald H. Morris
Los Osos, CA

—We supply an alternative to defdisk on AC disk #13 called movsys by Paul Kienitz.—Ed.

All letters are subject to editing. Questions or comments should be sent to:

Amazing Computing
P.O. Box 869
Fall River, MA 02722-0869
Attn.: Feedback

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Macro Paint:

Pointing Toward The Future

by R. Shamms Mortier

Let's begin our look at the future by recounting some so-called "impossibilities" of the past:

First, people viewed as pure fantasy the idea that an Amiga paint program could be designed so that one could work in observable overscan. Then Microillusions released Photon Paint. Later, some held as inconceivable the notion that affordable and professional animation software could be combined with painting tools on the same disk. Then Electronic Arts introduced DeluxePaint III. Color cycling in HAM was also an impossibility, until Seven Seas released Doug's Math Aquarium and Math-Animation. HAM ANIMbrushes, an allegedly unachievable configuration, promise to swing and sway in OXXI's Spectracolor.

How about real-time, 4096 color painting in hi-res on your Amiga monitor? Surely, at least this is a certain impossibility!

As an experienced Amiga artist and animator, I thought I had seen the last of new Amiga paint programs. Apparently not, because in recent months we have seen the introduction of half a dozen new packages. Macro Paint is one of them, and a unique one at that. Apparently motivated by the cries of Amiga artists and video obsessives for more on-screen colors in non-HAM resolutions, the Macro Paint developers have presented a whole new host of possibilities.

One of these new formats is Dynamic hi-res, which allows 4096 colors in the Amiga's hi-res mode (with or without overscan and/or interlacing). This is a standard that NewTek's Video Toaster can manipulate and paintingly play with, and it just happens to be the same format that Macro Paint addresses. Now, the Toaster does not allow for real-time viewing on your Amiga screen (an "impos-

bility"), but Macro Paint does. No need to purchase another monitor to see the result. To perform its magic, Macro Paint requires a lot of memory, so 1 meg Amigas probably won't be able to play this game well. A minimum of two is suggested for adequate tool use, and the more the merrier. The software is not copy-protected, can be copied to your hard disk, and responds well to accelerator boards. A necessary patch must be added to your startup-sequence, unless you are working with the new 2.0 Kickstart/Workbench. The manual is extremely brief, and lacks tutorials; however, the tools are clearly explained and detailed.

Macro Paint sports the now standardized tools and icons, but also adds a

made to disk for the proper font. This is a bit redundant and time-consuming, as it would be better to have the chosen font loaded in permanently, and also worth while to have the text "float" freely before being pasted in. Perhaps this will be redressed in a future upgrade.

Macro Paint does not recognize anything but standard Amiga fonts (no ANIMfonts or ColorFonts). As to the latter, that really is a shame. Can you imagine being able to create a page of hi-res ColorFonts (like KARA fonts) whose metallic colorations varied in the vertical plane?

Determining and sizing "Regions" (areas of the screen set aside for selected processing commands) is a special at-

Displaying an image in Macro Paint.



few new ones to the game. These are toggled on from the toolbox and from special pull-down menus. Toolbox choices also have keyboard equivalents. The Text mode operates in an unexpected way: after typing your choice of text data in an entry box and hitting the return key, you must hold the left mouse down while a search is

tribute of Macro Paint. Regions can be saved to disk, but not moved. They can be used as areas where pictures will be loaded, or for more esoteric image processing. Another special and new drawing feature that Macro Paint users can enjoy is the "Halftone" option. This is not halftoning as recognized by printers and

A Dynamic
hi-res color
spread
created in
Macro Paint.



publishers, but rather a unique tool specific to this program. There are two gadgets on the toolkit that alternately turn one or the other scanline off, creating shading effects on area fills, which Macro Paint calls a "Halftone". A nice way to use these features is to overlay halftoned areas on top of other halftoned areas, achieving semi-transparent layers of color, and even moiré-like patterns. With a little

experimentation, very professional effects can be created in this manner. There are two stenciling gadgets that also operate in a manner new to Amiga paint programs. One allows you to paint only on the chosen background color, while the other protects the background color.

Many Amiga paint programs are ARexx-intensive these days, and Macro Paint is one of the heaviest contenders in

this area. The Macro Paint manual devotes fully half of its pages to ARexx commands and procedures. The manual probably suffices as much as a tutorial for ARexx as it does a reference for Macro Paint, making one suspect that the developers are hoping that ARexx enthusiasts add modules to the program.

Macro Paint will load any Amiga IFF graphic, including HAM paintings and brushes, and translate them into hi-res. You may have to resize them, but they will appear on the screen. I experimented by loading in and resizing several video-res HAM paintings, and it worked fine. Pictures can be saved as Dynamic hi-res or standard 24-bit files. The manual advises using ASDG's Art Department for conversion to other formats, an exercise I also accomplished successfully. Brushes may be loaded in and saved, and also rotated, flipped, and resized. Brushes can also be lightened, darkened, tinted, made into 16-level grayscale monochromatic images, and pasted on the screen as normal, blended, additive, or subtractive colors.



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SAS Campus Drive
Cary, NC 27513

Circle 126 on Reader Service card.

REGIONS

As stated before, Regions are special to Macro Paint, and they can be heavily processed with a variety of tools. Macro Paint is constantly remapping the screen as you paint, but Regions can also be selectively remapped when desired. If you select to have either the whole screen or just an inner area made into a region, that area can be flipped horizontally and vertically. It can also be either sharpened (colors reduced) or smoothed (colors added) for effect. Like brushes, regions can be lightened, darkened, tinted, and monochromed. There are also four color choices that might be a welcome addition for color-processing purposes (desktop publishing) and for Amiga photographers, as they act as color filtering tools: Cyan filters out reds, Magenta filters out greens, Yellow filters out blues, and Complement gives you a color negative.

WHO SHOULD INVESTIGATE MACRO PAINT?

1. Any Amiga owner who desires to experiment with 24-bit painting (e.g., anyone who owns a NewTek Toaster, or any other device that incorporates 24-bit art and animation).
2. Anyone who uses ASDG's Art Department or Art Department Pro, because the images that Macro Paint produces can easily be translated into any other Amiga format (and some non-standard Amiga ones as well).
3. Any Amiga visual person who simply must own every new painting program that is introduced to the marketplace, and who doesn't care about sleep anymore.

PROBLEM AREAS

A famous (or was it an infamous?) Amiga developer once told me that all 1.0 releases of software are just advanced BETA releases, meaning that it's always in 1.1 and above that a package really starts to show its stuff minus glitches, plus the incorporation of feedback from users. If you are running an older Amiga 1000 that has only 512K of Chip RAM, you will find that Macro Paint does not appreciate your system as much as it does a 1 or 2 meg Amiga.

One area I found in need of some tweaking was in the initial setting for overscan in the screen size/resolution menu that pops up first. If you leave the

overscan "height" set to 440, you can't touch the colors in the palette. By setting it to 430, you can just reach them, and with no overscan (600 x 400), everything's fine. The toolbox/menu viewport cannot be moved as in Digi-Paint and other Amiga programs. If it could, this overscan problem could be solved.

FUTURE UPGRADE ADDITIONS?

First on my list of new features would be the addition of ColorFonts. The program is a natural environment for composing screens of multiple ColorFont sizes and colors for videographic production and genlocking equipment. Secondly, I would love to see a dithered colorfill option. Imagine a smooth hi-res background with hundreds of color variations! An animated digital timing clock could be added so that time-consuming operations could be notated (for that important coffee break). As of now, the program does not multitask. All Amiga programs should be able to multitask. Lastly, there is a ready market of Innvision's Broadcast Titler 2.0 owners just waiting for Macro Paint to

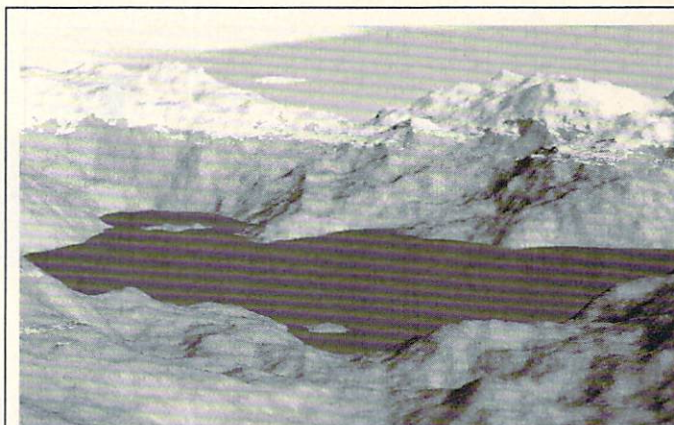
handshake with them. Broadcast Titler 2.0 also has the capacity to display hi-res graphics in expanded palettes of color, and Lake Forest Logic should check this out.

All in all, Macro Paint is a nice addition to the selection of Amiga paint programs. It definitely sets many necessary conditions for the next round of Amiga painting software, and it is a useful utility to other products on the market. It's always nice to look forward to the upgraded release of a product after it's been field tested and soaked in user feedback for a while, and I'll be waiting to see what future releases of this product will bring.

•AC•

Macro Paint
Price: \$139.95
Inquiry #228
Lake Forest Logic, Inc.
28101 Ballard Rd., Unit E
Lake Forest, Illinois 60045
(708) 816-6666

[Macro Paint V1.1, not yet released, will fix the overscan problem, and will also include ColorFonts.—Ed.]



Create your own fractal worlds!

Scene Generator is the most realistic fractal landscape software available for your Amiga. The above picture is an example of one of the millions of scenes that may be created with this powerful graphics tool. **Scene Generator** uses fractals to create natural scenery based on random numbers. You can change many factors including the steepness, snow and water levels, lighting angle and colors. Pictures are compatible with other Amiga graphics software and make nice backgrounds for animation and painting.

"...produces the most photographically realistic fractal landscapes I've seen on a computer screen." , .info magazine, October 1990

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UPGRADES

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FIXES

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UPDATES

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NEW

RELEASES

bug bytes

by John Steiner

RECENTLY, I RECEIVED several letters from readers with bug reports. Richard Botello of San Antonio, TX wrote to warn IntroCAD Plus users of a bug that caused his system to crash, resulting in the subsequent loss of a drawing. He had selected a triangle element he created from graphic primitives and, after executing the hatch command, realized that he had not grouped the elements he selected. After the crash occurred, he found, through experimentation, that if he tried to hatch a single graphic element, a crash would occur. The simplest workaround to this problem, according to Mr. Botello, is to be sure that more than a single graphic primitive is selected before the hatch function is selected.

PREVIOUSLY IN "BUG BYTES" (V5.10, October 1990), there appeared a report on the inability of the game Treasure Trap, from Electronic Zoo, to work on an Amiga equipped with a Supra Memory Expansion card. A letter from Asha DeVelder of Guerneville, CA sheds some light on this situation. To run the program without having to remove the expansion memory from the computer, locate a program called "NoFast" (this program is not the same as "NoFastMem" found on the Workbench disks). Run the NoFast program and reboot with Treasure Trap in df0:. All fast memory will be disabled for the

duration of the game. Mr. DeVelder suggests that NoFast can be found on local BBS systems, commercial information services, or on a public domain disk collection.

LON GOWEN OF MESA, AZ wrote reporting on a problem he found in both the Lattice and Manx C compilers. He demonstrated the problem using code compiled for version 5.0 of the Aztec C compiler (C68K), running under AmigaDOS 1.3 on an A1000. The problem occurs when an attempt is made to copy a constant character array from one location to another when the length of the array is an odd number of bytes. The compiler attempts to perform the copy but, during the process, the address register is set to point to the stack at an odd address location. After the pointer is set, a MOVE.L instruction—the destination of which is that odd address—is attempted. The system will crash with an odd-address exception.

The obvious solution, according to Mr. Gowen, is to simply avoid the use of odd-length character-constant arrays. Use an extra element in the array, even if the program doesn't need it. He comments that both the Lattice and Manx compilers should report an illegal function call or other error when this problem occurs. A follow-up letter from Mr. Gowen reports that the Manx

version 5.0b fixes many errors, including the odd address error mentioned above. He goes on to write that registered Manx users can obtain the new version by writing to Manx's technical service department. Version 5.0b does not fix the erroneous use of integer variables as pointers, however.

JOSEPH MCCARTHY OF TROY, AL wrote to remind me of an undocumented option when using AREAD and AWRITE commands. In an earlier edition of "Bug Bytes" (V5.10, October 1990), I reported that you could use CrossDOS to transfer files to the Bridgeboard. The command "AREAD DI0:FOOBAR.EXE C:FOOBAR.EXE" will transfer the file, but it will also convert non-Amiga characters to their Amiga equivalents, an undesirable occurrence for IBM executable files. When copying executable files in this fashion (files ending in .EXE), terminate the AREAD or AWRITE command with "/B", which will prevent the conversion from taking place. The correct usage would be "AREAD DI0:FOOBAR.EXE C:FOOBAR.EXE /B".

MERRILL CALLAWAY of Albuquerque, NM wrote describing a problem he has when using RUNBACK to execute the program FacII. If he runs these two programs together on his system, problems arise when CLIMate and some

other programs are run. Increasing the stack size improves matters, but never solves the problem completely.

Some programs, when activated with RUNBACK (FaccII among them), cause the shell that ran them to fail to close with an ENDSHELL command. Mr. Callaway found this to be true with both AmigaDOS 1.3 Shell, and William Hawes' WShell. He has an Amiga 2000 with a Pacific Peripherals SCSI card, a Seagate ST138N hard disk, and a Supra RAM A2000 4 meg RAM expander card with 5 megabytes total. Please write if you have ever had any problems with

been rewritten to support Workbench 2.0. The latest version even allows programs to be launched from within ScreenX if used with Workbench 2.0.

There appears to be one problem with the new program: many people have reported that it crashes upon shutdown. It appears that more stack memory needs to be reserved before the program is run. You can change the stack in the .info from the default 4096 bytes to 10,000 or 20,000, and that should solve the problem. If you run the program from the CLI, just set the stack before you run ScreenX.

preview program can be executed from within WordPerfect or as a separate program. By printing a document to disk using the Preview printer definition, and then choosing the Preview option, the file can be viewed as a representation of a printed page. Users with extra memory can execute Preview inside WordPerfect.

A status line feature has also been added which will show the character or code immediately preceding and following the cursor. This feature, called "Status Line Codes", can be toggled on or off and will let you examine codes while in the document screen. Registered WordPerfect Amiga users may obtain the maintenance update for \$15.00 plus a \$3.00 shipping charge. WordPerfect Corporation, 1555 North Technology Way, Orem, UT 84057, (801)226-4147. Inquiry #202

ScreenX—the freely redistributable program designed to capture and save into IFF format any currently available Amiga screen—has been updated to version 3.0.

these programs run in concert, or can provide any help, explanation, or workaround.

A PRESS RELEASE issued by Designing Minds announced Top Form version 2.0 (see product review, page 25 of this issue) and an upgrade to Roll 'em, the company's electronic teleprompter program. Owners of Top Form version 1 may upgrade by sending in their original disks with a check or money order in the amount of \$18.00; they will receive the update and a new manual by return mail. Roll 'em now uses Mirrored Fonts as standard. Owners of Roll 'em without these fonts may send their original disk to Designing Minds; the new fonts will be added to their disks at no charge. Designing Minds, 3006 North Main Street, Logan, UT 84321, (801) 753-4947 voice or FAX. Inquiry #200

STEVE TIBBETT, AUTHOR of the popular VirusX, and other "X"-series programs, has updated ScreenX to version 3.0. ScreenX is a freely redistributable program designed to capture and save into IFF format any currently available Amiga screen. It has

ANIMATION: JOURNEYMAN, from Hash Enterprises, is now shipping. All registered Animation: Journeyman customers should have already received the upgrade, along with a brand new manual. New features of the program include a new design for action, resizable channel windows, improved character interface, and enhanced display and selecting features. Other advancements include improved zoom function, faster redraw, 24-bit output, and numerous bug fixes.

Animation: Journeyman runs on the A2500 and A3000 only, and requires 3 megabytes of RAM. If you haven't registered your copy of Animation: Journeyman, you should do so soon in order to receive the latest upgrade. Hash Enterprises, 2800 E. Evergreen Blvd., Vancouver, WA 98661, (206) 573-9427. Inquiry #201

A RECENT ISSUE of WordPerfect Report announced the pending availability of a maintenance update to Amiga WordPerfect 4.1. The powerful word processor will reportedly support Workbench 2.0. The update also includes a print preview feature. The

PROGRESSIVE PERIPHERALS & Software has mailed an update to registered 3-D Professional owners that includes a new Ray Tracer module, and associated manual. Here is yet another example of the importance of mailing in your registration card. Progressive Peripherals & Software, 464 Kalamath Street, Denver, CO 80204, (303) 825-4144. Inquiry #203

IF YOU OWN The Art Department from ASDG, check PeopleLink's Amigazone or your favorite service or BBS for the TAD patches. This archive will update all registered versions of TAD to version 1.0.3. The Art Department and Art Department Professional are both highly capable graphics manipulation programs. ASDG, Inc., 925 Stewart Street, Madison, WI 53713, (608) 273-6585. Inquiry #204

If you have any workarounds or bugs to report, or if you know of any upgrades to commercial software, you may write to John Steiner, c/o Amazing Computing, P.O. Box 869, Fall River, MA 02722...or leave EMail to Publisher on People Link or 73075,1735 on CompuServe.

•AC•

An Impulse To Imagine

by R. Shamms Mortier

MIKE HALVORSON, THE CEO AND "VIP" OF IMPULSE, has a personality that is reflected in the products he dreams into existence. That is, either you love 'em or you don't—there is no middle ground. Personally, I admire Mr. Halvorson because he is very vocal about where he thinks Amiga software should be going, and whether you agree with his observations or not, he pulls no punches in saying exactly what he believes. When I interview him, all I have to do is to ask one question, then sit back and write like mad. He often flavors his responses with a colorful and at times spicy Chicagooan vocabulary that adds to the enjoyment of listening.

As for the products Mr. Halvorson's flagship Impulse develops, I have long sung their praises from the rooftops, especially those of Turbo Silver. My love for Turbo Silver has been an obsessive but sometimes frustrating one, because it has never quite delivered everything it promised. I was first driven to the edge of madness by the way that it handles animation, and then by its convoluted manual. I overlooked those difficulties, however, because Silver (in all of its generations) produces such sweet and evocative stills, replete with shining surfaces, specular drops of light, and colors worthy of a rainbow. I came to rely on other software to generate animations from my imported Silver still frames.

Mr. Halvorson finally ran out of room to incorporate the entire spectrum of desired options and changes in the Silver upgrades. It got to the point where continuing to rework Silver would have been more time consuming and expensive than starting again from scratch, so the decision was made more than a year ago to do just that. Silver continues to be a tremendously successful product, with as many registered users overseas as the market can bear, so risking a whole new venture was not without its anxiety. Add to that the clamor caused when Imagine failed to ship on the date originally targeted (prompting Impulse to send out a less-than-satisfactory late beta version), and you had the makings of a potential trag-

edy. Would the "real" Imagine 1.0 live up to what we have come to expect from the Halvorson "engines of transformation"?

Packed City!

It seems the newest game in town is to market software that does everything from A to Z, with enough room left over on a single disk to store the complete Library of Congress! Impulse demonstrates its mastery of this practice with the release of Imagine. The disk is not copy protected, but just to discourage would-be pirates, the user's name is placed at the top of the initial introduction screen when the program boots. There is, by the way, a nifty (and quite simple) installation procedure that allows you to target the program for either "vanilla" (68000) or accelerator board (68020/30—68881/82) usage.

To say Imagine is "packed" with features is an understatement; for all that it does, it really defies comparison with any other Amiga 3-D package. Yes, it does all of the things that any generation of Silver is able to accomplish (and in a much more friendly fashion), but it also includes (drum roll and cymbals, please!) full 3-D character animation!

"Character Animation" is distinguished from other kinds of computer-generated animation because the "characters" or "actors" that you create can be choreographed to emulate natural organic movements. I'll explain a bit about how Imagine accomplishes this a little later on.

Sins of the Elder Redressed

In addition to the complexity of Turbo Silver's animation interface and its confusing manual, there are some other aspects of that program that take some getting used to. For one, it does not multitask easily. The program has always worked more slowly than I would like, though recent releases have made better use of accelerator boards.

Well, Imagine multitasks like a charm, and really flies along, too—especially the accelerated version. The Imagine manual, penned by Rick Rodriguez, is only some seventy pages long, but is a model of clarity (and empathy) for the user. Experienced Silver owners will recognize much of the material, but there are so many new ways to handle old things in Imagine that every user should go through its manual once. In fact, new functions—such as 3-D character animation—are accompanied by extremely detailed tutorials that demand a good run through. I normally prefer to see an index, but can live without one in this case. The manual appears to be much too thin to adequately address all that Imagine is capable of, but Mr. Rodriguez is entitled to take credit both for explaining what is necessary in a clear and concise fashion, and for incorporating a wealth of detailed graphics along the way.

Dedicated Environments

Imagine allows you to: Create 3-D images from scratch. Add object attributes—reflection/refraction, texture mapping, IFF-Brush wrapping, specular, etc.—to those images. Manipulate all of the objects as to rotation, placement and sizing in near-real time. Place any selected objects from your stored library of images in a scene, including global data such as horizon and azimuth colors, and ambient light. Light the scene with located and colored sources. Set a number of frames so that the scene can be fully animated, encompassing both camera movement and "actor" choreography.

Develop a stored library of choreographed primitive basic actors, to which any objects can be applied, resulting in near organic looking movement potential. These actions are accomplished on five dedicated editing screens: Project, Detail, Forms, Cycle, and Stage.

The Project Screen

After the Introductory Imagine screen (that with your name emblazoned at the top) slides up, the next place to go is usually the Project screen. It is here that projects are both started and continued (from previous saves). It's also at this juncture that you tap into the Parameters Rendering Requester. This allows input as to generated image size, resolution, save/format, and save paths for stills and movies. Here again, Imagine's save/load operations are much simpler and more intuitive than Silver's. The neat thing about this requester is that the Project "Modify" command gives you repeatable access to it, meaning that you can continually adjust the parameters until your picture or movie looks just right. Movies, by the way, can be saved either in Imagine's proprietary format (meaning they can be played from this screen), or in the standard ANIM format (meaning they cannot). I usually save mine in ANIM because I like to tweak them in an Amiga paint program. There is also a toggle gadget here for those who have Impulse's "Firecracker 24" board in their system. If that board isn't present, the gadget is ghosted. Images are saved without icons, so I usually have Glacier Technologies' "Icon Magic" running in the background so I can generate ".info" files. Images are also saved from the get go, whereas in Turbo Silver, you have to hit the "S" key while the image is displayed on the screen to save it.

The Detail Editor

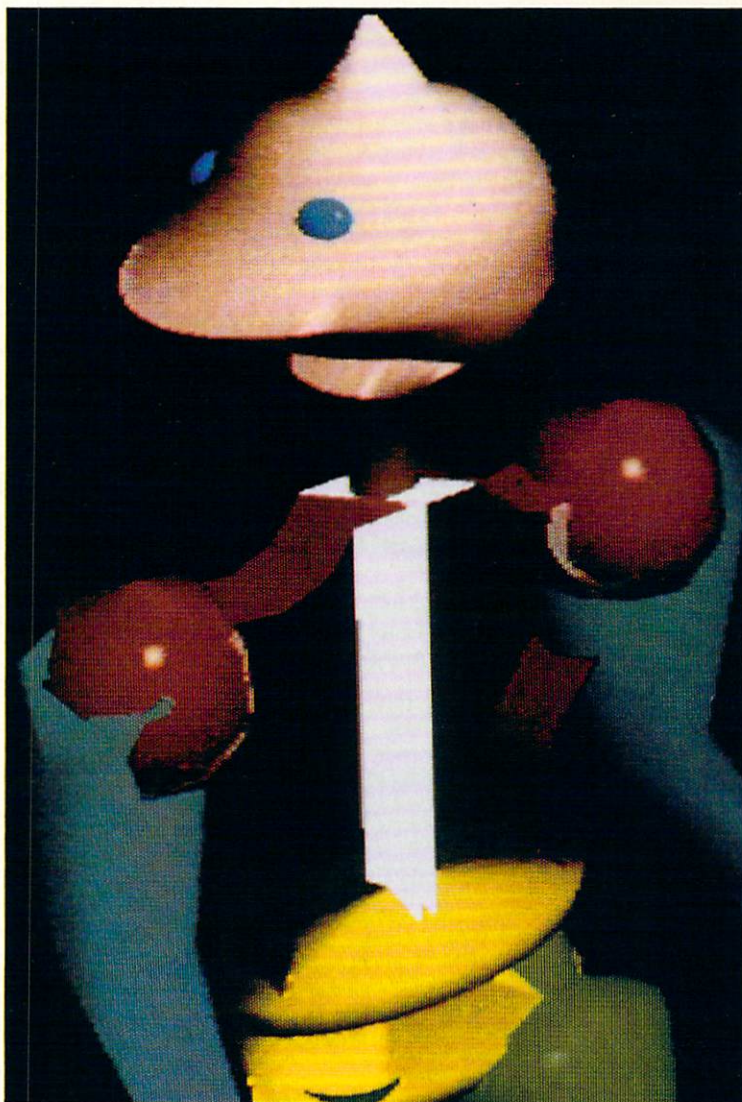
The Detail Editor screen includes some territory familiar to Silver users. Here, new objects are created with points, lines, and polygonal "faces". There is a new Boolean "slicer" that allows you to automatically assign polygonal faces to objects, and a tutorial that explains its use. A new "Magnetism" tool aids in the creation of smooth curves, and can even be used to create terrains filled with rippling mountains. It is also here that lathing and extruding operations (now very familiar to Amiga 3-D enthusiasts) take place, all with accompanying tutorials for the novice. Some new tools are "Conform to Cylinder" and "Conform to Sphere", which

creates shapes unexpected as well as intuited. The Attributes Requester—a familiar device to Silver users—lives on this screen, though it has been streamlined and clarified in Imagine. Amiga artists and animators have come to expect the option of wrapping IFF brushes around 3-D objects; it probably determines whether or not a 3-D package will ultimately reach its market potential. Usually, this can mean an extra disk worth of code, or at least a fat portion of a program. Imagine allows IFF wrapping without bloating the size of the program in the least, and it all happens on this edit screen (the manual clearly explains how this is accomplished). Imagine's "Texture Mapping" capability refers to the special textures that are contained in its texture library, replete with

numerical indicators for size and reflectivity. Bricks, Checks, Wood, and other choices are present, and the process is fully detailed in the manual.

The Forms Editor

Nothing like Imagine's Forms Editor screen exists in Silver, or anywhere else as far as I know. This is the place where more organic forms are created, all from a generic starting point which is a sphere with user input slices and points. There are three basic things that can be done: edit (move) points, add them, or delete them. You would hardly think that these tools would be enough to create spectacular 3-D forms, but they are. By experimenting awhile, you can push and pull at these spheres and save them one by one until



A HAM overscan still—not retouched by a paint program—from a generated sequence.

AMIGA 3-D: ON THE COMEBACK TRAIL!

Well, it's true it never really subsided totally, but there hasn't exactly been a flood of new 3-D programs in the Amiga market over the last year or two, either. The kings of the hill have always been Videoscape 3D, Turbo Silver, and Sculpt-3D/Animate 4D.

These programs have been advancing slowly and, for the most part, if you wanted to do 3-D on the Amiga, you had to use one of them. Well, no more.

First, rumors are flying about the Mac version of Sculpt being ported back to the Amiga this year. Good news for those both hoping for an upgrade to "4D" and cursing the company for shifting gears to enter the Mac world.

Second, competition in the rest of the 3-D world is really heating up. 3-D Professional burst out of the gates with an extensive array of features and direct 24-bit support, not to mention excellent manuals and an included instructional videotape. Caligari is now available in several versions, from consumer to broadcast. Lightwave 3D, part of the Video Toaster setup, is poised to turn the masses onto 3-D rendering.

Companion programs to these 3-D packages are growing in their scope as well. DigiWorks 3D, Pixel 3D, and similar programs create 3-D objects from IFF pictures, a feature so popular most new 3-D programs now include it. The program Interchange, used to convert one program's objects to another, is trying to keep up with it all via updates. 3-D titlers such as VideoTitler 3D and 3D Text Animator are gaining popularity. 3-D terrain/landscape programs such as Vistapro and Scene Generator let you create your own worlds. And lastly, the big news—Imagine is out!

We're just starting to use it in our studio and already I can tell it's going to be a "keeper". Lately I've been getting a lot of mileage out of Imagine's brush-mapping features. Since Imagine allows up to 4 (count 'em!) brushes to be mapped onto any object, I'm currently producing some ads for our cable channel which feature a wall of images taken from different pay channels. I used to do this in DeluxePaint III with perspective, but in Imagine I can add light sources to create a convincing "gleam", set the walls to reflect nearby objects or images, and make the wall itself a texture such as marble, glass, or plastic. It's also incredibly easy to position exactly where on your object the brush will appear, and how large it will be. The boolean method of allowing objects to be used as "cookie cutters" to create new objects, or to map a face onto an existing object, is excellent as well. One drawback I've noticed is the method used to input numbers for attributes such as colors and textures; it needs to be replaced with mouse sliders like those used in other parts of the program.

As my past articles readily confirm, I am not the biggest fan of the Turbo Silver family. I have always felt that there is an excellent program in there, somewhere, struggling to get out. Unfortunately, a steep learning curve as well as a large cluster of unorganized features have kept me at bay, until now. While there is still a learning curve associated with Imagine, it's definitely not as steep, and our production team has been able to learn about it while expending limited time and encountering few hassles. The Imagine interface is logical, organized, and provides so many variables that the possibilities are truly endless. The output in HAM and 24 bit is, as standard, truly beautiful.

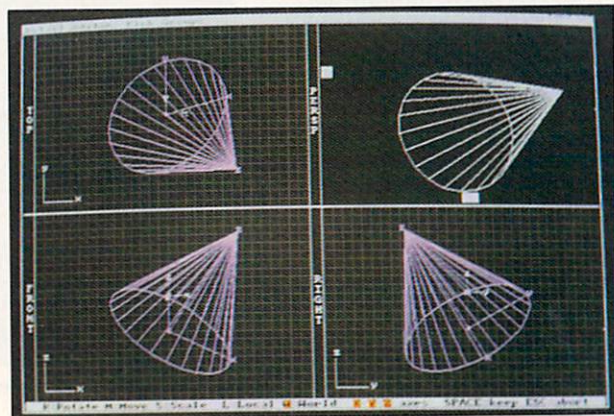
The road has been rocky but the end result is worth the wait. Impulse has created a natural extension of the Turbo Silver family that is not an excellent program struggling to get out of an interface—it's just an excellent program. And it's out!—Frank McMahon

you have all of the necessary elements for a true character. There are various ways to manipulate data points, and even though the manual presents a nice tutorial, there is a learning curve associated with getting it the way you want it. All of the editing screens present you with four views—top, front, right, and a special perspective view. What makes the perspective view special is that it reacts to any changes made in the object *instantly*! And that's not all. It also has sliders which function to turn the view in perspective so it can be appreciated from any angle! There's more. By selecting a shaded function, you can get an instant grayscale and shaded, full-screen perspective view. Any of the four editing screen views can be instantly enlarged to fill the entire screen, and then moved back in place when needed. The Forms Editor screen allows you to design 3-D images that match anything you can Imagine.

The Cycle Editor

This is it—the heart of Imagine's magical kingdom. There is presently no other software that allows you to do what can be accomplished here (the only software that does anything even close to this is Hash Enterprises' Animation: Apprentice, not nearly as user-friendly or as downright intuitive as Imagine). To put it simply, the Cycle Editor allows you to build choreographed archetypes, movement figures that you can later assign any objects to. You can, for instance, build a walking figure and set it in motion. Later, you can assign any head or other body part to it that you desire, so that one Cycled form can be the action component of an infinite variety of characters. Imagine (!)—a whole library of body parts and a whole library of sculpted 3-D elements to plug in at will. Bring on the movie cameras! The parts are hierarchically attached, so once assigned, the movement of one part brings the movement of connected parts into play. Thus, when a hand is lifted, the forearm and shoulder follow in a smooth, believable motion. Hips sway as legs walk, and a torso bends when the figure crouches. The manual sports a full tutorial demonstrating the construction of a walk cycle. The entire animation can be previewed in wireframe right there on the screen in real time, and tweaked for the finest results. Of course, you can set any objects up in an involved and connected hierarchy—3-D polygons, planets, IFF brushes, text—an endless and addictive panoply!

A look at Imagine's Detail Edit Screen.



The Stage Editor

Of course, it does no good to merely set a figure in motion in a single, stationary location. An actor also needs a directed path of movement to follow on the set. The Stage Editor allows you to load in all of the necessary characters and props, and then set the animated Cycled actors onto moving paths. As in the Cycle Editor, all movements can be previewed in wireframe in real time before anything is committed to storage and taping. Yes, the entire scene can be updated and previewed in real time, and the camera view can also be displayed. A special scripting menu can be accessed here for the extreme fine tuning of positions, sizes, movements, and any of the other necessary final ingredients. All of the Editing screens take advantage of special commands that are always in view at the bottom of the screen: R=Rotate, M=Move, S=Scale, L=Local, W=World, X-Y-Z Axis, and Space=Set/ESC=Abort. This means that objects, cameras, paths, and props can be moved and repositioned in real time by selecting their

appropriate axis and using the simple on-screen commands.

In Conclusion

I tipped my hand at the beginning of this article by telling you that I am biased in favor of Impulse products, the result of long hours spent with Turbo Silver in all its incarnations. I have not, however, allowed that predisposition to blind me, and so spent at least 150 hours with this software before undertaking this review. Except for one time when I hit a series of wrong commands, the software never crashed on me.

You do have to take care when generating stills or ANIMs that you have enough memory left, or else polygons have a way of disappearing from your images. The remedy here is to save your project and reboot the program before generating images, and obviously, to have as much RAM as you can afford! I came away amazed, and more addicted to Amiga art and animation than ever.

My expectations for an upgrade? Pretty basic. I still would like to see an index in the manual. I also prefer Silver's way of allowing you to set a target point for the camera, and also cast my vote in favor of incorporating Silver's alternate camera settings (wide-angle lenses, etc.).

I'm sure the Martian mind of Mr. Halvorson has much more in store for Amiga folks in the future (including a super animation that he is working on at this very moment!). You certainly have to admire him for giving so much of his creative juices to the Amiga community, and once you see Imagine, you will come to share my enthusiasm for the man and the company behind it. This is truly a piece of software that allows you to get to what the Amiga does best—creative work.

•AC•

Imagine

Price: \$350.00

Limited time upgrade offer

for registered Turbo Silver users: \$150.00

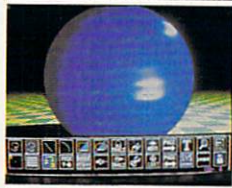
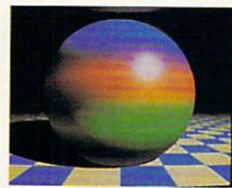
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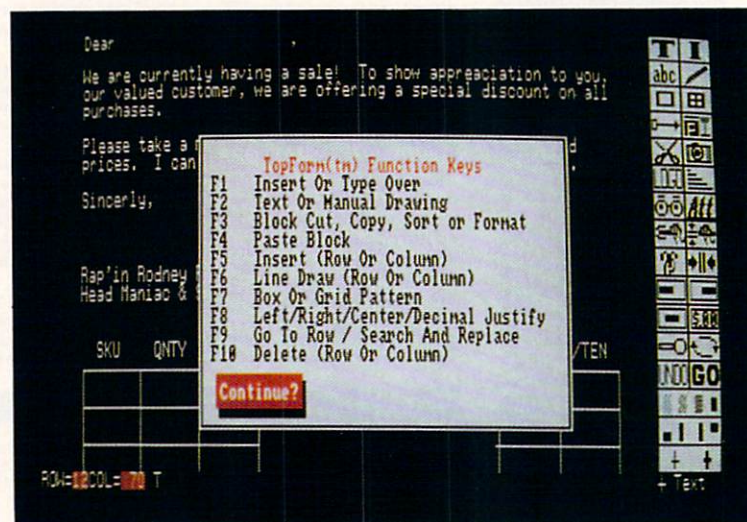
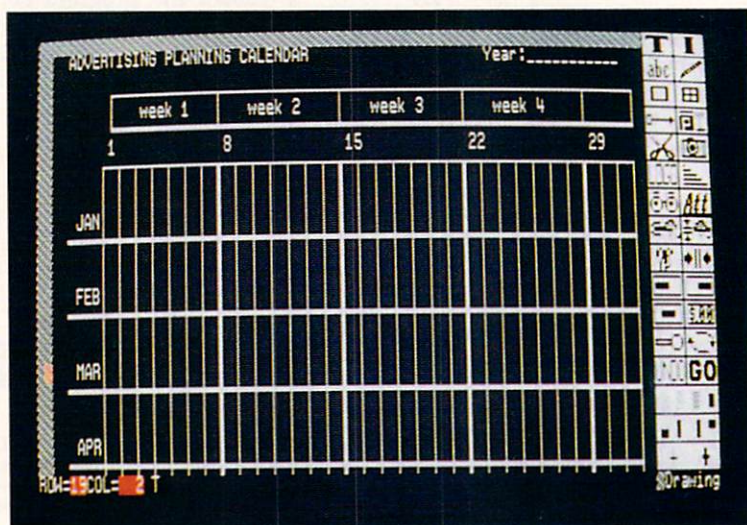
Circle 101 on Reader Service card.

Top Form

by Jeff James

One of the most lucrative and hotly contested segments of the MS-DOS software market is that of form generating software. Software capable of quickly and easily creating the thousands of forms that an average business requires every year is in high demand, and MS-DOS customers have spent millions on fulfilling their needs in that area.

What about Amiga owners? Many Amiga owners use their Amigas in business every day, and most of them must create and disseminate the same logjam of paperwork that their MS-DOS counterparts contend with. Until just recently, Amiga owners who wanted to use their favorite computer for form publishing were forced to use traditional desktop publishing software packages (which are overpowered for the job, or simply too expensive) or word processing and paint programs (which may lack adequate line-generation and text-creation abilities, respectively). But several recent entries in the Amiga market are striving to rectify this unfortunate situation. Top Form, a new dedicated form publisher from Designing Minds, is one of them.



top: Top Form's Main screen
bottom: Top Form's Help requester

The Top Form package includes a spiral-bound, 109-page manual, a warranty registration card, and two unprotected diskettes within a textbook-sized box wrapped in a color slip cover. Hard disk owners will be pleased to hear that Top Form is fully hard disk installable via an included hard disk installation script. Once installed, Top Form occupies a little under 2 megabytes of hard disk space. The manual states that you can use Top Form on any Amiga with at least 512K and a single floppy drive, which is true. But after using Top Form on both 512K and expanded Amiga systems, I strongly recommend that you have at least 1 megabyte of RAM and two floppy drives before trying Top Form for yourself.

After the program has loaded, Top Form's main form creation screen appears. The layout of this screen will be familiar to many Amiga owners, with two columns of icons draped on the far right side of the screen, *à la* DPaint. When activated, the menu bar at the top of the screen displays Top Form's pull-down menus.

The strip of icons at the right (identified by the term "control panel" in the Top Form documentation) allows a user to access nearly all of Top Form's form-generating features with the click of a mouse button. Icons to toggle between insert and typeover text modes are present, along with those which allow the user to draw lines, boxes, grids, and simple graphics.

In addition to the icon-driven control panel, most of Top Form's features can be accessed through a combination of keyboard shortcuts (most functions can be activated by pressing the F1 through F10 function keys), or by selection from pull-down menus. In addition to form-creation tools that enable line, grid, and box drawing, other helpful and useful features are available to users. An ability to merge both ASCII format text

and ASCII format data into Top Form from popular Amiga word processor and database programs, respectively, is implemented, as well as a math macro utility which can be used to automate mathematical operations needed on entered numerical data. Several unique and useful features for customizing forms—such as an incrementor value feature (which allows you to print forms such as invoices with incrementing numbers) and a date-and-time-stamping option—

and boxes drawn in Top Form *always* connect smoothly and perfectly.

Once you have created a form using the line- and box-drawing tools, you can access the layout menu option in the project menu to adjust some form parameters. Similar to a word processor's "page setup" option, this feature is used to enter and edit decimal and standard tab stops for text, set the maximum number of rows and columns, specify horizontal or vertical printing, turn on the

***UNTIL JUST RECENTLY, AMIGA OWNERS WHO WANTED TO USE
THEIR FAVORITE COMPUTER FOR FORM PUBLISHING WERE FORCED
TO USE TRADITIONAL DESKTOP PUBLISHING SOFTWARE PACKAGES
OR WORD PROCESSING AND PAINT PROGRAMS.***

are also included. The handling of large amounts of text is facilitated by Top Form's search and search-and-replace functions, which help you catch last-minute organizational errors in text before you send a completed form to your printer.

Many forms created for corporations and other organizations prominently display a company logo or letterhead, and Top Form, at first glance, appears to have the ability to import IFF graphics for this purpose. On the control panel is an icon titled "Logo", which is obviously intended to allow users to add IFF graphics to adorn their documents. Unfortunately, when I clicked on this icon I got a requestor stating "Logo is not available. Watch for next release!" While Top Form does include a rudimentary drawing tool for creating acceptable (if not awe-inspiring) graphics, better drawing tools and a capability to import IFF color graphics would make Top Form much more useful. One useful feature of Top Form's drawing tools is worthy of note here: using what the box cover describes as "intelligent logic", lines, grids,

incrementor function, and even start an "auto-save" feature. Unfortunately, changing any of these options requires the user to forsake the Amiga mouse and resort to keyboard entry. A greater dose of "Amigatization" needs to be applied to Top Form to make the program easier to navigate through.

To be honest, the feature in Top Form that I most looked forward to using is that which provides the ability to "fill in the blanks" of previously created forms. Instead of printing out the form and then manually filling in the blanks with a pencil or pen, this capability allows users to enter appropriate data into a form *before* printing, resulting in a completed form that looks much more professional than one covered with ink stains and lead smudges. To use this feature, Top Form requires that you create "bookmarks" indicating where on a form you want the data to be input. Unfortunately, implementation of this feature presently leaves much to be desired. The manual offers little in the way of a tutorial on the subject, and I tried in vain for nearly an entire afternoon to get

an acceptable result. Only after a call to Designing Minds' friendly and helpful technical support staff was I finally able to get the bookmarks function to work properly.

Top Form's interface initially appears to offer a full complement of point-and-click features. The inclusion of this icon-laden control panel and pull-down menus are evidence of the developers' attempts to make Top Form easy to use. However, it has been said that "beauty is only skin deep", and Top Form's limited adherence to point-and-click simplicity can be viewed in that context. For example, you can easily choose to print a form by using the mouse to select that option from the pull-down project menu. But once you've selected that option, you must verify your choice to print by manually typing in a "Y" or "N" via your keyboard. Top Form's interface, although entirely functional, may take some time to get used to.

Thankfully, Top Form does offer a limited on-line help capability through the "help" pull-down menu on the main screen. The "View Attributes" menu option displays salient printer information like the currently selected printer driver and the special text attributes that the chosen printer is capable of, such as underlining, subscripts, italics, etc. Another help option lists the keyboard equivalents of Top Form's main functions, which are all conveniently located on each of the Amiga's ten function keys. On-line help is a welcome addition to Top Form, although I wish it was more extensive. Instead of simply listing what each function key does, it would be more helpful if this option provided longer descriptions, including an example of each key and its functions.

To print a form, you first must create one from scratch, right? Wrong! Thanks to the more than 100 ready made forms provided in the Top Form package, that

doesn't have to be the case. Beyond that, Top Form is shipped with a generous 127 form *examples*, including forms for daily planners, bowling leagues, sales reports, etc. Nearly all of the ready made forms are done well, and most of the forms an average user might ever require can be found here. These prepared forms can also be modified easily to fit most users' exact needs.

Ultimately, the proof is in the printing, so to speak, and by this measure, Top Form lives up to its name. Top Form ignores preferences printers, instead relying upon nearly two dozen custom printer drivers which Designing Minds supplies with Top Form. Top Form utilizes your selected printer's built-in line- and character-generating ability, resulting in clear and crisp, "jaggie-free" output. While Top Form's method of printing is by no means as flexible as that of PageStream and ProPage (which utilize structured font

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technology to achieve smooth output), it still produces clear and crisp results. I tested Top Form on a Citizen GSX-140 24-pin dot matrix printer (using the Epson LQ driver), and all the forms generated were crisp and easy to read. Printer drivers for the most popular printers, as well as a rudimentary PostScript driver, are included. For Top Form owners who don't have a printer supported by Top Form, a printer driver generation utility is included. Dabbling with printer control codes is not a job for the uninitiated, but the accompanying documentation in the Top Form manual is fairly helpful. A friend of mine who also purchased Top Form reports that Designing Mind's technical support staff was very cooperative in helping him create his own custom printer driver.

When I contacted Designing Minds for help with the bookmark function, a spokesman informed me that Designing Minds is in the process of adding several enhancements to the program. Features which might appear in the next revision include support for ARexx, a visible on-screen grid to aid users in making tables, and the implementation of the "logo" function, which would allow users to import small IFF graphics for use as logos. Some of the requestors are being redone, with a special emphasis on Top Form's data and text importing and exporting capability. When asked about the possibility of supporting Amiga bitmapped fonts, the Designing Minds spokesperson informed me that this is not presently being considered, mainly due to the poor printed quality of bitmap fonts. However, they do plan to fully support any advancements in AmigaDOS concerning vector-based Amiga fonts.

As it stands, Top Form is too unwieldy and difficult to use to be of much benefit to an Amiga novice, or to someone who has only a very a limited need for creating forms. If you simply need to create a few forms during the course of a year, there are several easy-to-use alternative solutions available. For novice Amiga

users, Pen Pal (Brown-Wagh) couples capable form generation with "fill-in-the-blank" ease of use, along with a full-featured database and graphic word processor. Amiga publishers who currently own Gold Disk's Professional Page or SoftLogik's PageStream can easily create their own forms, or use the third-party templates available from SoftLogik (for PageStream), or Corwyn International's UltraForms for both PageStream and ProPage.

A more consistent user interface, coupled with easier access to Top Form's more advanced features (such as bookmarks) and the ability to print IFF graphics would go a long way in prompting me to give an across-the-board recommendation for this promising package.

Certainly, if you need to grind out dozens of individualized forms a year, Top Form does have several powerful features. The bookmark and merging

functions (for both text and data) are invaluable, the extensive macro abilities are essential for large form publishing projects, and the wealth of prepared forms make Top Form a good choice for industrial-strength form generation. Top Form is undoubtedly loaded with a wide ranging suite of powerful features, and if you can get past the steep learning curve and put up with a few of the program's idiosyncracies, Top Form is an excellent new tool for those who want to rely more heavily on Amigas to do their business.

•AC•

Top Form
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CDTV: Developers And Consumers Say "YES" At CES!

LAS VEGAS, NEVADA was once again the scene for the Winter Consumer Electronics Show. But Commodore Business Machines, Inc. was impatient to announce CDTV (Commodore Dynamic Total Vision) to the international consumer press. CBM scheduled their big press conference for the evening before CES began. Irving Gould, Gail Wellington, Nolan Bushnell and a host of other Commodore executives rolled out their worldwide introduction of CDTV.

CDTV is Commodore's latest edition to the expanding line of hardware products based on the Amiga. (Commodore's remarkable UNIX-based machine comes in next). CDTV combines the technology of the Amiga and the storage capabilities of compact disc to create a new consumer product for learning and entertainment.

Irvin Gould, Commodore International Limited's chairman and chief executive officer, called CDTV "a revolutionary new product category that transforms consumer electronics and computer technology into a powerful new media that will enrich and enhance everyday life." Mr. Gould was standing before a packed audience of press and industry notables.

Gail Wellington, Director of Special Projects for Commodore International, Ltd., noted the large assortment of software developers for CDTV and introduced the newest, *Grolier*. The *Grolier Electronic Encyclopedia* contains all 21 volumes of *Grolier's Academic American Encyclopedia* on a single CD-ROM. Nolan Bushnell, general manager of the Consumer Interactive Products division of Commodore International Limited, noted in a companion press release, "The search and retrieval capabilities provide immediate access to information. Parents and children will have fun doing homework assignments or simply 'thumbing through' the information."

Some of the new features available in this latest release of CDTV include screens designed by Jim Sachs, one of the Amiga's

most famous artists. His audio screen (used whenever a standard CD is placed in the unit) displays a CD image and a section to list the tracks. As the user chooses the tracks (or the CDTV performs a shuffle), the numbers are displayed in small blocks. Once the CD is activated, a play head hovers over the appropriate disc area and a "laser" beam is seen traveling from the head to the disc and reflected back to the head. If the disc is stopped and removed from the player, both the head and the disc slide off the screen.

When playing audio CDs it might be important to check if they are CD+G. CD+G refers to hidden graphic tracks that are encoded on the compact disc. Several compact discs currently contain these hidden graphic files that play like a slow music video, but CDTV is one of the few consumer-priced units that will display these secret graphics.

CD+MIDI is another special feature of CDTV. It appears that some artists have encoded their music with MIDI information that will allow the listener to play the music through MIDI keyboards and create entirely different sounds. This feature was being constantly demonstrated by Mike Lehman, author of UltraCard and a developer for CDTV.

One of the other great features demonstrated for CDTV is its built-in capability to allow software to be written in a multitude of languages. Several developers are taking advantage of this feature at launch; however, once CDTV is available, every developer will be able to create a single piece of software that can be used on any CDTV around the world.

There was good news for Amiga 500 owners. Commodore displayed the A690 (working title) Amiga 500 peripheral that will allow Amiga 500 owners to use CDTV. Unfortunately, no firm pricing has been set for this peripheral, scheduled for a June 1991 release. Amiga 2000 and Amiga 3000 owners will need to wait longer for their

access to CDTV. Although Commodore executives say that a device is under development, no one would offer an expected delivery date.

While Commodore is unwilling to quote expected sales figures, it is interesting to note the degree of support and the talent working on CDTV products. **Walt Disney Computer Software** and **Grolier** lead a large number of developers who have adopted the CDTV format.

One of the longest-awaited products for CDTV has been **Tiger Media's** *Airwave Adventure—The Case of the Cautious Condor*. Tiger Media President Laura Buddine stated that the product was ready and waiting for the final release of CBM's CDTV. Based on a 1930's-style murder mystery with vintage comicbook characters and scenes, "Condor", stated Ms. Buddine, "is the first title to be developed specifically with the interactive capabilities of optical disc platforms in mind." Tiger Media is also the producer of the *CATS CD Manager* which was instrumental in developing CDs using **Sun Microsystems' SPARCstations**.

Barney Bear Goes To School will be **Free Spirit Software's** first product for CDTV. Available at CDTV's release, *Barney Bear Goes To School* (\$34.95) is a very popular children's interactive game that teaches how to get ready for school, safety, and participation in learning activities.

Merit Software will release two products for CDTV, their *Classic Board Games* and *All Dogs Go To Heaven Talking Crayon*. *Classic Board Games* contains the three favorites Chess, Checkers, and Backgammon, completely redesigned for CDTV with play updates available in six different languages (French, German, Japanese, Spanish, Italian, and English).

All Dogs Go To Heaven Talking Crayon is based on the animated film by Don Bluth. Music and words from the movie are available in all 30 pictures and children

can obtain audio instructions at the touch of a button. Merit is an old hand at developing electronic crayon software; this is their sixth package.

With over 46 packages available by the release of CDTV and with hundreds now under development (Commodore has announced that there will be two hundred titles by Christmas 1991), CDTV has a vast assortment of products coming forward.

NewTek Can Be In Two Places At Once

As if it was not enough that NewTek attracted large groups of people to their booth at CES, they were doing the same in San Francisco at the January MacWorld Exposition. Offering digital effects at CES easily attracted video and consumer dealers, but NewTek's presence at MacWorld gave the Toaster/Amiga combination exposure in the Mac market as a video peripheral for the Macintosh. According to NewTek executives, the features of the Toaster/Amiga are exactly what Macintosh owners want and are far less expensive than products available for the Macintosh.

That's Entertainment!

Beyond CDTV, CES had thousands of other exhibitors, the largest assortment of which were game manufacturers. With Nintendo occupying an entire pavilion, and other hardware producers maintaining extremely large booth areas, the event was like a magnet for anyone producing entertainment software. Most developers provide products for more than one platform, yet in the past it was very difficult to find Amiga software at CES. Today, however, there are a growing number of developers who do not want to miss the opportunities of developing entertainment software for the Amiga. Here are just a few of the many we uncovered.

Accolade announced a new distribution agreement with U.S. Gold, a leading entertainment software developer in Europe. U.S. Gold will be supplying Accolade with four new titles scheduled to be available by April 15, 1991—Gold of the Aztecs, International Soccer, Vaxine, and Rotox.

Accolade also announced the release of several new Amiga games of its own. Jack Nicklaus Presents The Great Courses of the U.S. Open is the latest add-on disk for Jack Nicklaus' Unlimited Golf & Course Design and Jack Nicklaus' Greatest 18 Holes of Major Championship Golf. In addition, Accolade has promised HoverForce, Jack Nicklaus Presents the Major Champion-

Clockwise from upper left: Compact audio discs with CD+G; CDTV titles ready for launch; The A690 CDTV peripheral for the Amiga 500.



ship Courses of 1991, Les Manley In: Search for The King, Altered Destiny, and Gunboat: River Combat Simulation. They should all be available this month.

Access Software Inc. announced the release of several new games. Mean Streets is an "Interactive Detective Movie" set in San Francisco in the year 2033. The interesting thing about this new game is that it was developed using full size sets, more than 30 actors, models, and extras, new techniques to digitize both sound and motion, and custom designed scale models. With the use of innovative video technology, Access has proven that today's game programmer is getting closer than ever to cinema directing.

California Dreams' Amiga games included Blockout, the 3-D strategy and reaction game, and, appropriately enough, Vegas Gambler. Vegas Gambler offers four of the most popular casino games in astound-

ing detail. Test your luck in Vegas without losing a dime.

But you could lose your heart over California Dreams' next release, Street Rod II. Remember your first car and how you fixed her up to run with the best? If you do, or if you never had the experience and want to live it now, Street Rod II (\$39.95) is a racing construction set and simulator in which you buy any one of 25 authentic cars and then customize it for road racing.

Solidarity (\$49.95) is more than a phrase at California Dreams. With this new graphic political simulator you form a Polish trade union during the dangerous days prior to the formation of the Solidarity trade union. As former members of Solidarity, game designers at the PZK development group in Warsaw, Poland used their personal experiences and memories to bring authenticity to this interesting creation.

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Top to bottom:
The audio screen for
compact audio
discs;
Optional CDTV track
ball and wired
control;
CDTV's multilingual
selection screen.

Cinemaware's TV Sports: Baseball will be ready in time for spring training. With practice modes for batting, pitching, and fielding, as well as the ability to trade players, TV Sports: Baseball (\$59.95) will bring network action play to the Amiga next month. In May, Cinemaware will follow with their release of Enemy Within (\$49.95). Enemy Within keeps players in touch with—but not always in control of—the action. In this offbeat spy thriller you deal with subplots as active as the main theme, and each person's personal agenda can have a devastating effect on your own. Rollerbabes, a high-spirited romp of roller derby and so much more was also announced for the Amiga, but a specific release date was not given.

Interplay's Castles (\$59.95) will let you explore the world of thirteenth-century castle building, but it will not be available for the Amiga until August 1991. Available sooner (April 1991) and a bit more modern is Cruise For A Corpse (\$59.95), in which a cold-blooded murderer aboard the yacht of a wealthy Greek shipowner stalks and kills the magnate's guests. In the future, everyone will play the TV gameshow Lexi-Cross, a game with a lovely robot and letter tiles, but Amiga owners will be able to buy it in May. Dvorak on Typing (yes, that is *the* Dvorak) teaches touch typing through step-by-step lessons with graphics and audio feedback. While Dvorak on Typing (\$49.95, Amiga version in June 1991) does not promise to make you a nationally recognized computer columnist, it does promise

to make you a more confident touch typist.

Back To The Future II (\$39.95) leads an army of new Amiga releases planned for this year by Konami. Back To The Future II follows the adventures of Marty McFly and Doc straight from the feature film. Theme Park Mystery (\$49.95) is your dream come true, if your dream is to inherit a deserted theme park from your mad uncle. Super C (\$19.95) continues your arcade activities against alien foes like the Jagger Froid and Red Falcon's brain.

New World Computing, Inc., the creators of Nuclear War, is about to bring its highly popular King's Bounty to the Amiga. King's Bounty is a role-playing/strategy game where triumph comes with conquest and conquest comes by besting villains on four continents.

Ocean is offering an entire universe of new games, including F29 Retaliator (\$49.95), Nightbreed (\$39.95), Billy The Kid (\$39.95), Battle Command (\$39.95), The Untouchables (\$39.95), and Lost Patrol (\$39.95).

Spectrum Holobyte's Flight of The Intruder (\$59.95) is also now scheduled for the Amiga; it brings Steven Coonts' tale of Vietnam fighting through 36 missions. There was also a hint that Red Phoenix would be developed first for the IBM and then for the Amiga, although the new Falcon 3.0 is scheduled only for the IBM.

UBI Soft announced a game of stacking balls and advancing levels, Pick'n Pile (\$39.95). Balls fall from the sky and must be stacked in columns of the same color. Get them stacked, they disappear, and you move to the next level. Pro Tennis Tour 2 (\$49.95) is your entry into the advanced world of professional tennis.

Virgin Mastertronic has taken the bizarre world of Lewis Carroll to new levels. Travel the world of Wonderland (\$59.95) as Carroll's most famous character, Alice. Also soon to be released are Guild of Thieves and Corruption, and Fish! All three Virgin releases are the products of Magnetic Scrolls. Virgin also promised Overlord (\$49.95), the simulation game that allows you to settle and develop an entire universe.

Soon-to-be-released entertainments include: Mindcraft's The Magic Candle Vol. 2: The Four and Forty (\$59.95); The Secret Of Monkey Island and Secret Weapons Of The Luftwaffe from Lucasfilm Games; and Armada 2525, D.R.A.G.O.N. Force, and Star Fleet II from Interstel Corporation.

•AC•



R O O M E R S

by The Bandito

[The statements and projections presented in "Roomers" are rumors in the purest sense. The bits of information are gathered by a third-party source from whispers inside the industry. At press time, they remain unconfirmed and are printed for entertainment value only. Accordingly, the staff and associates of Amazing Computing™ cannot be held responsible for the reports made in this column.]

The Bandito wants to caution those of you out there who think that Commodore may be introducing a new Amiga in the UK: it isn't necessarily so. While they have announced the Amiga 1500 over there, it's really just a marketing strategy. They've taken an ordinary A2000, added a second floppy, put on a new nameplate, and presto!—a new computer! Why would they do such a thing? Well, the Brits are notoriously frugal when it comes to buying hardware, so Commodore hopes that they'll be more likely to buy this than the A2000HD, which is more expensive. Of course, they're bundling software with it to make the deal more attractive.

The European hardware market continues to evolve, and there are some changes in buying habits. Of course, the Amiga has been the leading format for entertainment software in Europe for some time, with the Atari ST in the number two slot and the IBM PC clones coming in a distant third. However, the IBM PC and its clone army recently threatened to take away the number two slot from the Atari ST. Atari is dismayed

to find its market share sliding away in its strongest market. The Bandito hears whispers that they may concentrate more of their corporate resources on the Portfolio and the Lynx, the best-selling areas of its many product lines. The eventual fate of the Atari ST? The Bandito knows of some landfills that could use bulking up...

The hardware business changes rapidly, and yesterday's hot product is today's lemon. Sometimes the rapid pace of change even obsoletes a product before it even comes to market. Such is the case with the oft-rumored A250, the cartridge-based version of the A500. The A250 has been shelved, probably forever. The idea now is to make CDTV the low-cost game/education/home machine.

This is not a bad idea, as putting games on CD-ROM is far more attractive to manufacturers than cartridges. First of all, CD-ROMs cost about \$2 a piece in quantity, compared to \$10 a piece for carts. Also CD-ROMs hold about 500 times as much information, which is not inconsiderable. The only advantage carts have is their near-instantaneous access time, while CD-ROMs are almost as poky as floppy drives. The solution is a clever use of the 1 megabyte of memory in CDTV to buffer images and sounds, though this is not always possible.

It's possible that CDTV may even replace the A500 entirely at some point in the future, if sales warrant. Though

The Bandito thinks it is more likely that Commodore would just keep moving the price of the A500 downward, keeping it below that of CDTV.

Target pricing for the CDTV introduction in the spring has been dropped to \$999 list. At the same time, the price of the A500 system may continue to move downward to make room for CDTV at the higher price point.

CDTV is on a fast track, but don't look for any improvements in the hardware. Special software compression/decompression routines could make a huge difference in the output. The Bandito has heard of some top-secret work at an unnamed Amiga developer, where they have created a software compression scheme that can get 15-frame-per-second video in a quarter-screen window at HAM resolutions. Oh, and that's with audio. Sounds like the perfect thing for CDTV, doesn't it? No extra hardware needed. But it does point out another problem: standards. The Amiga needs a motion video standard to get ready for the future of computing and it would be best to put one into place now before a zillion competing standards mess up the marketplace.

While we're on the subject of standards, the ancient IFF standard needs revamping. Let's devote some attention to this again, Commodore! Among the many things lacking are a new standard for object-oriented files,

animation files, 3-D object files, rendering information, and multimedia files. Also don't forget better instrument and sound files; the 8SVX standard is far below the best quality possible on the Amiga.

Though CDTV is late, the era of CD-ROM is fast approaching for the Amiga: HyperMedia Concepts has announced that the entire Fred Fish software library will be available for the Amiga on CD-ROM. The disk contains the data of all 410 floppies in the Fred Fish collection in ready-to-use format and in ZIPed format for use by BBS SYSOPS. You get all this for only \$70. HyperMedia Concepts also plans to offer updates with all the new Fred Fish disks every four months, which will cost only \$30 for registered owners. Of course, you have to have a CD-ROM for

attend WOCA while Amiga dealers should be able to offer some very good prices on Amiga hardware from Commodore.

The same letter mentioned that Commodore would like to have a second show in the Fall on the West Coast. Yet Commodore did not mention which group they would sponsor for the event. It is important to note, however, that Commodore's emphasis is on a professional show in a high-traffic area. This eliminates AMI Shows' Oakland site. Also, if AMI Shows doesn't cancel their show in New York, it could mean full support for The Hunter Group throughout North America.

All of this should not hurt AMI Shows. Their European operations are doing much better than their US ones. None of the US shows have drawn even half the attendance or exhibitors of the European shows.

It seems Digital Creations—with product developments aimed squarely at Digi-View and the Video Toaster—may be giving NewTek a real run for their money.

your Amiga. The disk is designed for use with any Amiga-supported ISO 9660 standard drive and Commodore's CDTV. Currently, Xetec provides an internal CD-ROM model for \$600 (external for \$700); these can be connected to any compatible SCSI interface. They include over 500 megabytes of PD software, including the Fred Fish disks up through #380.

Amiga Show Wars

The two giants of Amiga trade shows are still set to run their New York shows only three weeks apart. AMI Shows and The Hunter Group have both marked New York as a prime spot for a trade show this Spring with the casualties being a divided market and a confused audience.

While AmigaWorld has sanctioned the AmigaWorld EXPO (surprise), Commodore has placed their full support behind The Hunter Group's World Of Commodore Amiga. In a letter to all developers, Commodore stated they would support dealers and developers with special meetings and on-site stocks of machines. This means developers have a better reason to

Toast of the Town

The Video Toaster is the main topic of discussion in the Amiga community these days, but it's also blazing hot in some unexpected places. There have been several articles in the PC magazine press. John Dvorak has written about it in *PC Magazine* and *MacUser*. They're not really standard Amiga magazines; however, *BYTE* magazine did a really fancy review of the Video Toaster with some glowing remarks. Rumors in Hollywood say the device may save tens of thousands in production costs for special effects.

Meanwhile, it is rumored that Commodore is promoting the Video Toaster and plans to make as much hay as possible. Look for special promotions, bundling deals, and advertising support. Already, many Amiga dealers are centering their advertising campaigns around the Video Toaster, using the lure of Amiga video to drag people into their stores.

While NewTek's Video Toaster has captured so much media attention, Amiga third-party developers are creating additional video products for the Amiga. While some products are

attempting to replace the Video Toaster, others are seeking to improve it.

One rather cautious Amiga developer is determined to offer a fix for the Toaster's TBC synchronous input problem. The company hopes to have a prototype to display at the next World Of Amiga in New York.

The V-Machine project at Digital Creations is going strong and they have just launched DCTV with raves from Amiga users all over. It seems Digital Creations—with product developments aimed squarely at Digi-View and the Video Toaster—may be giving NewTek a real run for their money. Although the V-Machine is currently planned with a \$6000 price tag, the "V" reportedly eliminates a lot of the annoying problems the Video Toaster has with TBC input.

And how about that new device that Progressive Peripherals is planning for video production—The Video Blender? Even though the name adds to the "kitchen" flavor of the Amiga market, resources at Progressive are very excited about its "very-soon-now" release.

Video is not the only song Progressive Peripherals is singing these days. Rumor has it that the entire staff of Progressive have been working hot and heavy on a very large assortment of Amiga products. While some have been announced and not shipped, others are not even whispers. The word is that Progressive's products will advance the Amiga into a truly professional arena. Look for some exciting news in the next few months.

All of this activity comes at an important point in the history of the Amiga. The installed base of Amigas has finally hit the 2 million mark. Compare this to about 6 million Macintoshes, and perhaps 60 million MS-DOS machines. Yes, the Amiga has quite a ways to go yet, but the next year or two looks good. The Amiga will finally be accepted as a business computer...for the business of video. And video is becoming an increasingly important medium of communication.

Look at the numerous catalogs available on video, video magazines, and even the growth of cable. It's amazing how much video is created each year, considering how expensive a video is to make. When the Amiga makes editing video as easy and

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inexpensive as it has made video effects, the result will be a boom in video production. Corporations of all sizes will have in-house video production and businesses large and small will use video extensively. We can't even imagine some of the uses that will be found for video, once it's cheap and easy to do.

The magic number seems to be \$10,000. That was the magic number for Apple; for under ten grand, you could get a Macintosh and a LaserWriter which gave the ability to produce professional-looking documents. Commodore needs to shoot for that same magic number: a complete video editing system for under that amount. Right now, the cameras and video recorders needed are a little too expensive, but the prices should be dropping fast. The Bandito thinks you'll be able to put together this dream system in 1992.

Every computer has its own niche in the market. The IBM PC and clones are the computer of choice for spreadsheets and word processing. The Macintosh is the computer for desktop publishing. And the Amiga is the only computer for graphics and video.

Sure, with the right hardware and software you can make any of those computers do most anything. The point is, people think of each computer in terms of its strength. And the Amiga's strength has always been graphics and video. Now with all of the Amiga developers creating video tools that just can't be found on any other computer,

this is the Amiga's ticket to respectability, and Commodore intends to run with it.

Paint Wars

There are some new faces showing up to take part in this lucrative battle: Macro Paint, boasting the first Dynamic hi-res painting capability (see review, page 17 of this issue), is an interesting entrant out of left field. And what of the top dogs in this battleground, the venerable DPaint III and Digi-Paint 3? New versions will emerge this year, say The Bandito's informants.

Bits and Pieces Dept.

Commodore's advertising blitz for the holiday season that just past was a huge effort. The main thrust revolved around getting Nintendo owners to move up to an Amiga 500. A hot new video for dealers, half a million direct mail coupons, and bonus packs of software aided their cause.

It seems that just as The Bandito warned, the Macintosh ROMs necessary for A-Max and other Macintosh emulators have disappeared due to Apple's new policy and the arrest of the counterfeiter. This has put plans for A-Max II Plus on hold, for now. [Editor's Note: Sorry, Bandito. A spokesperson for ReadySoft Inc. not only informed us that current sales of A-Max II are doing very well, but ReadySoft is also going full steam ahead on all future product developments.]

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A new company is planning a similar board that goes in an IBM PC, though it costs \$1,000. Why not buy a Mac for that price? The Bandito hears that Mac ROMs may well be licensed out to other companies, so that they may again become available.

Here's an exciting news flash: Trip Hawkins is no longer the president of Electronic Arts! Trip is now CEO and Chairman of the Board, while Larry Probst, formerly in charge of sales, handles the day-to-day operations as Chief Operating Officer. What does this mean? Well, don't look for any vast changes right away. But the Bandito expects that Electronic Arts will seek to expand its very profitable distribution business (they control over a third of all entertainment software sales in the U.S.) and perhaps minimize its not-so-successful publishing group. There are a few bright spots in their in-house publishing division, though. PowerMonger (see "Diversions", page 39 of this issue) and The Immortal are good solid Amiga titles, and the upcoming Centurion: Defender of Rome looks to be a winner. It's a classic Cinemaware-type game done by Kellyn Beck (Defender of the Crown, Bits of Magic), with some slick Jim Sachs graphics.

Well, time has run out for this month, but The Bandito has his sights set on acquiring more inside information, so stay tuned!

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AC Disks

Source code and executable programs included for all articles printed in *Amazing Computing*.

- 1 **AC V3.8 and V3.9**
Gels in MultiForth Parts I & II: Learn how to use Gels in MultiForth. Author: John Bushakra
FFP & IEEE: An Example of using FFP & IEEE math routines in Modula-2. Author: Steve Fawiszewski
CAI: A Computer Aided Instruction program with editor written in AmigaBASIC. Author: Paul Castonguay
Tumbler's Tots: A complete game written in Assembly language. Save the falling babies in this game. Author: David Ashley
VGad: A gadget editor that allows you to easily create gadgets. The program then generates C code that you can use in your own programs. Author: Stephen Vermeulen
MenuEd: A menu editor that allows you to easily create menus. The program then generates C code that you can use in your own programs. Author: David Pehrson
Bspread: A powerful spread sheet program written in AmigaBASIC. Author: Bryan Catley
- 2 **AC V4.3 and V4.4**
Fractals Part I: An introduction to the basics of fractals with examples in AmigaBASIC, True BASIC, and C. Author: Paul Castonguay
Shared Libraries: C source and executable code that shows the use of shared libraries. Author: John Baez
MultiSort: Sorting and intertask communication in Modula-2. Author: Steve Fawiszewski
Double Playfield: Shows how to use dual playfields in AmigaBASIC. Author: Robert D'Asto
'881 Math Part I: Programming the 68881 math coprocessor chip in C. Author: Read Predmore
Args: Passing arguments to an AmigaBASIC program from the CLI. Author: Brian Zupke
- 3 **AC V4.5 and V4.6**
Digitized Sound: Using the Audio device to play digitized sounds in Modula-2. Author: Len A. White
'881 Math Part II: Part II of programming the 68881 math coprocessor chip using a fractal sample. Author: Read Predmore
At Your Request: Using the system-supplied requestors from AmigaBASIC. Author: John F. Wiederhirn
Insta Sound: Tapping sound from AmigaBASIC using the Wave command. Author: Greg Stringfellow
MIDI Out: A MIDI program that you can expand upon. Written in C. Author: Br. Seraphim Winslow
Diskless Compiler: Setting up a compiler environment that doesn't need floppies. Author: Chuck Raudonis
- 4 **AC V4.7 and V4.8**
Fractals Part II: Part II on fractals and graphics on the Amiga in AmigaBASIC and True BASIC. Author: Paul Castonguay
Analog Joysticks: The code for using analog joysticks on the Amiga. Written in C. Author: David Kinzer
C Notes: A small program to search a file for a specific string in C. Author: Stephen Kemp
Better String Gadgets: How to tap the power of string gadgets in C. Author: John Bushakra
On Your Alert: Using the system's alerts from AmigaBASIC. Author: John F. Wiederhirn
Batch Files: Executing batch files from AmigaBASIC. Author: Mark Aydelotte
C Notes: The beginning of a utility program in C. Author: Stephen Kemp
- 5 **AC V4.9**
Memory Squares: Test your memory with this AmigaBASIC game. Author: Mike Morrison
High Octane Colors: Use dithering in AmigaBASIC to get the appearance of many more colors. Author: Robert D'Asto
Cell Animation: Using cell animation in Modula-2. Author: Nicholas Cirasella
Improving Graphics: Improve the way your program looks no matter what screen it opens on. In C. Author: Richard Martin
Gels in MultiForth-Part 3: The third and final part on using Gels in Forth. Author: John Bushakra
C Notes V4.9: Look at a simple utility program in C. Author: Stephen Kemp
1D Cells: A program that simulates a one-dimensional cellular automata. Author: Russell Wallace
Colourscope: A shareware program that shows different graphic designs. Author: Russell Wallace
ShowLBM: A program that displays lo-res, hi-res, interlace and HAM IFF pictures. Author: Russell Wallace
Labyrinth II: Roll playing text adventure game. Author: Russell Wallace
Most: Text file reader that will display one or more files. The program will automatically format the text for you. Author: Russell Wallace
Terminator: A virus protection program. Author: Russell Wallace
- 6 **AC V4.10 and V4.11**
Typing Tutor: A program written in AmigaBASIC that will help you improve your typing. Author: Mike Morrison
Glatt's Gadgets: Using gadgets in Assembly language. Author: Jeff Glatt
Function Evaluator: A program that accepts mathematical functions and evaluates them. Written in C. Author: Randy Finch
Fractals: Part III: AmigaBASIC code shows you how to save/load pictures to disk. Author: Paul Castonguay
More Requestors: Using system calls in AmigaBASIC to build requestors. Author: John Wiederhirn
MultiForth: Implementing the ARP library from Forth. Author: Lonnie A. Watson
Search Utility: A file search utility written in C. Author: Stephen Kemp
Fast Pics: Re-writing the pixel drawing routine in Assembly language for speed. Author: Scott Steinman
64 Colors: Using extra-half-brite mode in AmigaBASIC. Author: Bryan Catley
Fast Fractals: A fast fractal program written in C with Assembly language subroutines. Author: Hugo M. H. Lypkens
Multitasking in Fortran: All the hard work is done here so you can multitask in Fortran. Author: Jim Locker
- 7 **AC V4.12 and V5.1**
Arexx Part II: Information on how to set up your own Arexx programs with examples. Author: Steve Gilmor
Leggo My LOGO: A Logo program that generates a Christmas tree with decorations. Author: Mike Morrison
Trees and Recursion: An introduction to binary trees and how to use recursion. Written in C. Author: Forest Arnold
C Notes: A look at two data compressing techniques in C. Author: Stephen Kemp
Animation? BASICally: Using cell animation with AmigaBASIC. Author: Mike Morrison
Menu Builder: A utility to help build menus in your own programs. Written in C. Author: Tony Preston.
Dual Demo: How to use dual playfields to make your own arcade games. Written in C. Author: Thomas Eshelman.
Scanning the Screen: Part four in the fractals series. This article covers drawing to the screen. In AmigaBASIC and True BASIC. Author: Paul Castonguay.
C Notes: Recursive functions in C. Author: Stephen Kemp.
- 8 **AC V5.2 and V5.3**
Dynamic Memory! Flexible string gadget requester using dynamic memory allocation. Author: Randy Finch.
Call Assembly language from BASIC: Add speed to your programs with Assembly. Author: Martin F. Combs.
Conundrum: An AmigaBASIC program that is a puzzle-like game, similar to the game Simon. Author: Dave Senger.
Music Titrer: Generates a titler display to accompany the audio on a VCR recording. Author: Brian Zupke
C Notes From the C Group: Writing functions that accept a variable number of arguments. Author: Stephen Kemp
Screen Saver: A quick remedy to prolong the life of your monitor. Author: Bryan Catley
- 9 **AC V5.4 and V5.5**
Bridging The 3.5" Chasm: Making Amiga 3.5" drives compatible with IBM 3.5" drives. Author: Karl D. Belson.
Ham Bone: A neat program that illustrates programming in HAM mode. Author: Robert D'Asto.
Handling Gadget and Mouse IntuiEvents: More gadgets in Assembly language. Author: Jeff Glatt.
Super Bitmaps in BASIC: Holding a graphics display larger than the monitor screen. Author: Jason Cahill
Rounding Off Your Numbers: Programming routines to make rounding your numbers a little easier. Author: Sedgwick Simons
Mouse Gadgets: Faster BASIC mouse input. Author: Michael Fahrion
Print Utility: A homemade print utility, with some extra added features. Author: Brian Zupke
Bio-feedback/Lie detector Device: Build your own lie detector device. Author: John Iovine.
Do It By Remote: Build an Amiga-operated remote controller for your home. Author: Andre Theberge
- 10 **AC V5.6 and V5.7**
Convergence: Part five of the Fractal series. Author: Paul Castonguay
Amiga Turtle Graphics: Computer graphics and programming with a LOGO-like graphics system. Author: Dylan MnNamee
C Notes: Doing linked list and doubly linked lists in C. Author: Stephen Kemp
Tree Traversal & Tree Search: Two common methods for traversing trees. Author: Forest W. Arnold
Exceptional Conductor: A quick response to user requests, achieved through efficient program logic. Author: Mark Cashman.
Getting to the Point: Custom Intuition pointers in AmigaBASIC. Author: Robert D'Asto
Crunchy Frog II: Adding windows and other odds and ends. Author: Jim Fiore
Synchronicity: Right and left brain lateralization. Author: John Iovine
C Notes From the C Group: Doubly linked lists revisited. Author: Stephen Kemp
Poor Man's Spreadsheet: A simple spreadsheet program that demonstrates manipulating arrays. Author: Gerry L. Penrose.
- 11 **AC V5.8, V5.9 and AC V5.10**
Fully Utilizing the 68881 Math Coprocessor Part III: Timings and Turbo_Pixel Function. Author: Read Predmore.
C Notes From the C Group 5.8 & 5.10: Functions supporting doubly linked lists, and a program that will examine an archive file and remove any files that have been extracted. Author: Stephen Kemp
Time Out! Accessing the Amiga's system timer device via Modula-2. Author: Mark Cashman
Stock Portfolio: A program to organize and track investments, music libraries, mailing lists, etc. in AmigaBASIC. Author: G. L. Penrose.
CygCC: An Arexx programming tutorial. Author: Duncan Thomson.
Programming in C on a Floppy System: Begin to develop programs in C with just one megabyte of RAM. Author: Paul Miller.
Koch Flakes: Using the preprocessor to organize your programming. Author: Paul Castonguay
Audiollusion: Experience an amazing audio illusion generated on the Amiga in Benchmark Modula-2. Author: Craig Zupke
Pictures: IFF pictures from past Amazing Computing issues.
- 12 **AC V5.11, V5.12 & V6.1**
Keyboard Input in Assembly: Fourth in a series of Assembly 68000 programming tutorials. Author: Jeff Glatt.
A Shared Library for Matrix Manipulations: Creating a shared library can be easy. Author: Randy Finch.
C Notes From The C Group: A discussion on cryptography. Author: Stephen Kemp
ZoomBox: Attaches a zoom box to an Intuition window and allows the user to toggle the window's size and its position. Author: John Leonard
- 13 **AC V6.2 & V6.3**
C Notes 6.2: A reminder program to display messages. Author: Stephen Kemp
More Ports For Your Amiga: Files to accompany article. Author: Jeff Lavin
Ultra Sonic Ranging System: BASIC Sonar Ranging program. Author: John Iovine
Writing Faster Assembly: Continuing the discussion of speeding up programs. Author: Martin F. Combs
C Notes 6.3: Working with functions. Author: Stephen Kemp

Diversions ...

Night Shift

by Miguel Mulet

Lucasfilm Games' Night Shift sees the very latest in "low-tech" manufacturing techniques thriving at Industrial Might and Logic, a decrepit factory that produces all those lovable action figures based on characters from famous movies. Trouble is, the factory's aging equipment tends to break down a lot, and that's where you come in. Your goal is to make sure that the manufacturing quota is met—and exceeded, if possible. If you are

Games reviewed this month:

Night Shift
James Bond: The Stealth Affair
Wolf Pack
PowerMonger
Harpoon

successful, large cash bonuses await you. If you fail, there is nothing left but to pick up your pink slip and start looking in the "Help Wanted" section of the classifieds.

The playing screen represents the BEAST, the machine that produces the figures. But since the BEAST breaks

James Bond:
The Stealth Affair

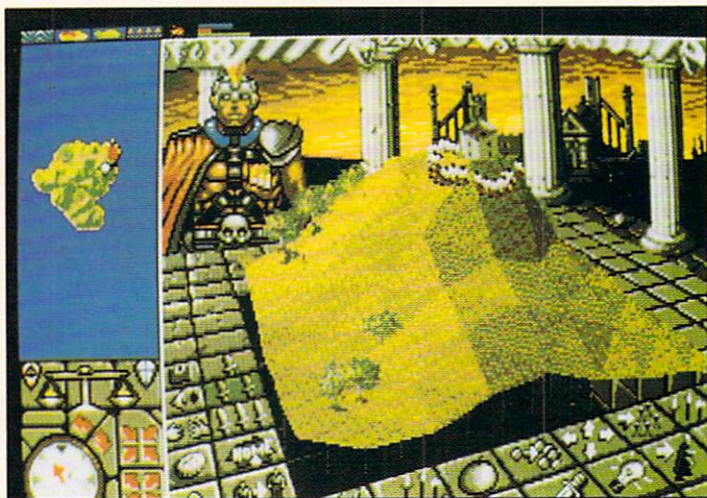


Night Shift



down frequently, you'll have to keep a watchful eye on the entire operation. This involves picking up tools you find scattered throughout the factory, repairing the machinery, and sweeping

away irritating little lemmings which are also trying to foul up the works. The BEAST is about two-and-a-half screens high by one screen wide, and loaded with things ready to break.



PowerMonger



Wolf Pack

You'll have to master the best paths to certain sections of the machine, without getting yourself injured. All this just to earn a few bucks!

Night Shift certainly provides a lot of action, and in varying forms. Each shift not only increases the quota of what is to be produced, but changes the items and the colors of them. In order to get things running, you must first learn how to set each switch, and then decide in which order to turn them. As you get further along in the shifts newer areas are revealed to you, thereby forcing you to constantly improve your skills.

The graphics are nice, but not breathtaking. The BEAST is portrayed in enough detail that you can figure out what and where things are, but there is a learning curve. A soundtrack plays in the background, supplemented by different alarms which sound when parts of the BEAST break down. The sound effects and soundtrack can be toggled off with a function key, if you have a need to play the game in the wee hours of the morning!

Overall, I enjoy Night Shift, although I still have a long way to go before I complete all the shifts. The game is a nice alternative to all those

arcade shoot-'em-ups, and it does stimulate a measure of brain activity in requiring you to memorize switch settings and the like. If you are on the prowl for a different type of arcade game, sign up for this Night Shift.

The Stealth Affair

by Miguel Mulet

The premise here is that someone just had to have a Stealth fighter for themselves, and since they cannot be purchased, that certain someone has thieved one from the good ol' United States. In hopes of retrieving the stolen aircraft quickly and quietly, the CIA has called in a few favors ...including "borrowing" Agent 007 from the British Secret Service.

Thus starts The Stealth Affair. Here you play Agent 007 in search of the missing aircraft. Your search begins in a small Latin American country where the plane was suspected to have landed. Of course, "Q" has sent you the usual care package, which includes such nifty items as a passport-forging machine, rocket-launching cigarettes, and a cutting pen, just to name a few.

The Stealth Affair is the latest from Delphine Software and Interplay, creators of the adventure Future Wars. They share the same "Cinematique" system, where no typing is necessary to issue commands. To move James, all you do is point to where you want to go and click. Issuing commands is as easy as pressing the right mouse button, whereupon a list of possible actions is displayed. Point and click again, and away you go.

The graphics are good—about the same as in Future Wars—with some scenes larger than others. Sound effects are used with good results, but (here again) are not spectacular. Unfortunately, the pop-up menus are difficult to use. Unless your cursor is positioned

in a particular area of the screen, you may find yourself unable to issue certain commands. Although this is not a fatal error, it is fairly annoying.

Game play is just average, and despite the fact that I am a big fan of James Bond, this game failed to keep me interested.

Wolf Pack

by Miguel Mulet

At the outset of World War II, millions of tons of supplies in the process of being shipped from the U.S. to England were lost to enemy U-boat attacks. These German submarines attacked the convoys relentlessly, usually in small groups at night. For this reason, one infamous group of U-boats became known as the "Wolf Pack", and that is where this game from Broderbund Software gets its title.

You have the option of playing either the commander of the group of submarines, or the commander of a group of surface vessels. Naturally, your strategy varies depending upon which role you play. I found play on both sides to be interesting and for the most part, evenly matched.

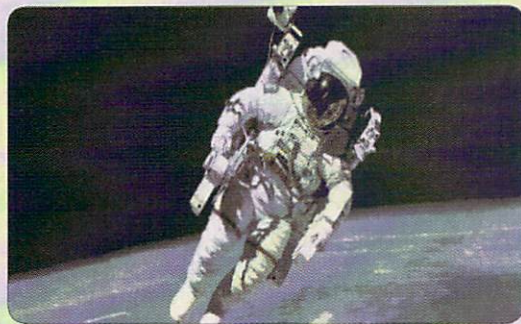
Wolf Pack comes with twelve prepared missions, as well as a construction set that allows you to create your own scenarios. The main screen allows you to set a number of parameters, such as which of the preset missions to embark on, which group of ships you'd like to command, whether it will be a day or evening mission, and even the year of the attack. Early on, Allied destroyers had no sonar, so it was easy for the subs to sneak in and attack ships prior to being detected.

Once you set up your game, you are transported to the bridge of the first vessel you command. There are several easy ways to move between ships, and you can issue commands from any ship in the fleet. Your

mission goals are displayed on a small teletype, and after that, it's up to you on how to achieve them. Everything is mouse controlled—from the firing of your torpedoes to the crash dive needed to avoid a rapid volley of depth charges. At the end of each

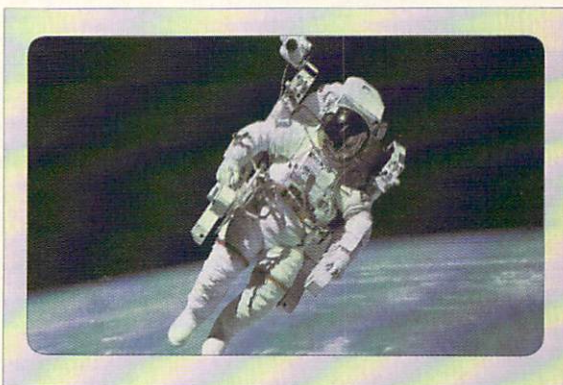
game, the computer assesses the losses of opposing ships versus your own, and then declares a winner.

Game graphics and sounds are adequate, although the display screen is a little choppy in displaying approaching vessels. Luckily, this doesn't



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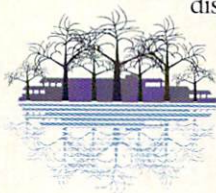


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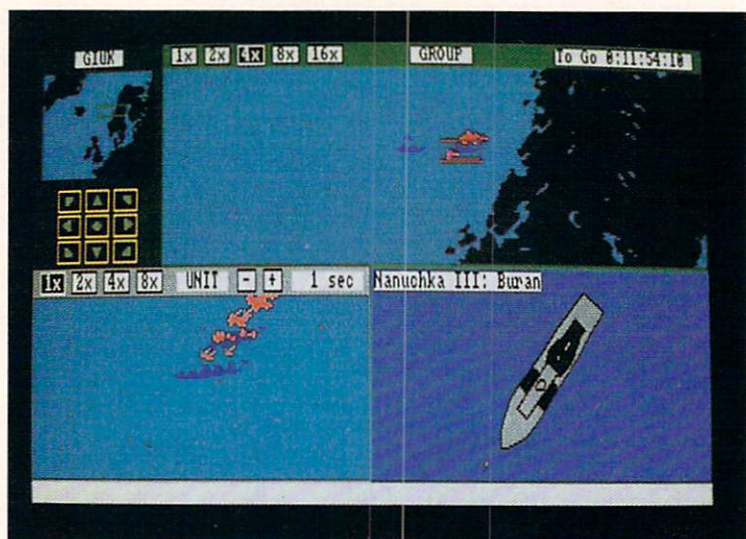
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Harpoon

detract from the game. Wolf Pack's greatest feature is strategic game play, of which there is plenty to be found.

If you are interested in the daring and dangerous submarine warfare of the World War II era, take a look at this one. It offers enough variety that you probably won't be disappointed.

PowerMonger

by Miguel Mulet

Tired of designing your own cities? Tired of dealing with karma, knights, and a fickle population? Or

maybe you want to build your own world and enjoy the excitement of conquering it yourself? If you answered "yes" to any of these questions, then you owe it to yourself to check out Electronic Arts' PowerMonger!

PowerMonger is a pseudo-sequel to the amazingly successful Populous. In PowerMonger, you essentially play a general who is attempting to conquer any and all lands that come into your view. Once you conquer one region, you can move on to conquer all 195 territories of this new world. At your disposal are one or more captains who are trained to faithfully execute your

orders with the troops under their command. Of course, you start out with just one captain, but as you become more powerful, you have the opportunity to gain both leaders and troops.

However, you can't live just by the sword. Your troops must also scout for food, spy on the enemy, and attempt to steal inventions created by your adversaries. These troops are also able to forge alliances with other cultures if you so desire, thus serving you as diplomats. As in real life, mother nature must also be taken into consideration. Nuisances such as rain, snow, and the change of seasons effect not only how quickly your troops are able to move, but also how much food they can find.

PowerMonger incorporates excellent sound and graphics. As a matter of fact, the sound effects provide vital clues to the world around you that you can't otherwise see. The coming of winter is signified by the winds that at first only gradually begin to blow through the tops of trees. Sheep, an important source of food, can be heard as they graze on nearby lands. Enemy troops can be heard well before they are seen, as by the flutter of wings of birds quickly abandoning their peaceful perches in advance of the approaching army.

Product Information

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There is a noticeable learning curve associated with PowerMonger—it's not as easy to get into as Populous. There is not much arcade action to be found here; the game focuses much more on the strategic aspect of world domination. If, however, you take the time to develop a good strategy and learn to play the game, you will be gratified as well as challenged.

Harpoon

by Rob Hays

Do you think you have the strategic and tactical abilities to defeat the Soviet naval commander in the North Atlantic during a major East-West conflict? Harpoon, from Three-Sixty, lets you try your hand at just that task. The action takes place around an area known as the GIUK (Greenland, Iceland, and United Kingdom) Gap, through which Soviet naval forces have to sail in order to reach the North Atlantic shipping lanes.

Harpoon is a computer version of the famous board game designed by Larry Bond, a former naval officer and warfare analyst. As in most board games of this type, players track the movements of their assets with stacks of small cardboard pieces. Attacks are resolved with dice and numerous tables listing the results of using weapon A against ship B with a dice roll of C. Add in complicating factors such as weather, ship heading, crew experience, etc., and a single scenario can take hours to complete.

Transferring the game to a computer allows all of the number crunching to be handled automatically, freeing the player to concentrate squarely on the strategy and tactics of the game. Quite a few calculations are required during game play, and the program does take advantage of the faster 68020 and 68030 microprocessors

that are standard in Amiga 2500s and 3000s.

The game includes an astonishing amount of information on the ships, planes, subs, and weapons available to both the NATO and Soviet navies. Tom Clancy used the original board game in writing parts of *The Hunt for Red October*, and in the foreword to the Harpoon manual he says the technical information supplied with the game was equivalent to that found in \$5000 worth of reference books.

The main display has two windows, one of which concentrates on individual Units within a Group, while the other shows a larger area and allows control of entire Groups. The coastlines shown in the Group window have been taken from actual Defense Mapping Agency Global Navigation Charts, and are accurate within the limits of the game.

Unlike most warfare simulations, which place you in command of a single ship or aircraft, Harpoon casts you in the role of either the NATO or Soviet Area Commander. You are mainly concerned with the big picture, not so much the operation of individual weapons. You issue orders to a Group, which usually consists of many separate Units, each Unit being an individual ship, sub, or aircraft.

For instance, you set the course and speed for the Group to follow. Then, using the formation editor, you assign specific ships or planes to specific sectors within the formation. Once you assign a helicopter to antisubmarine patrol duties, you never have to return it for refueling. You don't have to make sure it listens for enemy submarines with its sonar. The defense of your Group is also auto-

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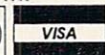
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matic, depending on the threat and a given Unit's ability to counter that threat. All of these details are taken care of by the Unit Commander, which is played by the computer.

If you wish to attack an enemy formation, your ever-present staff assistant advises you if the target is out of range, or if there is any other reason the Group cannot carry out your intentions. If your attacking Group is within range and has suitable weapons, you are presented with a screen allowing specific Units' weapons to be assigned to specific targets.

The 120-page bound manual includes detailed descriptions of all functions and commands, and 20 pages of background information on strategies and weapons systems. The manual appears to be left over from earlier IBM versions, with the first ten pages detailing different IBM installation options.

The graphics are of the IBM level—not up to Amiga capabilities, but adequate. There are some short animations presented when ships are attacking or under attack. Sounds are limited to warning sirens, explosions, helicopters, etc. The only music (different for each side) is played during the sinking of a ship and at the conclusion of a scenario. In defense of what some may consider to be a shortfall in the sound department, let me say that this type of simulation does not need (nor would it be as enjoyable with, in my opinion) a music soundtrack playing all the time.

One thing I feel is sorely needed is a keyboard overlay or a quick reference card for all of the available commands. A page in the manual is devoted to this information, but during the heat of battle, I'd rather not have to dig out the information I need. All commands are available with the

mouse and menus, but when playing the game on a standard Amiga 500, waiting for the program to display the menus can be agonizing. Due to the computational overhead inherent in this game, such anxious moments can approach several seconds, depending on the complexity of the scenario being played.

Take Harpoon onto an Amiga 3000 with Workbench 1.3 and a difference is immediately evident. The menus pop up with no delay, the maps scroll much more smoothly and the program responds at once to key presses. The game action itself is not affected by the higher clock rate of the 68030 processor, which means the game has been programmed correctly for processor compatibility.

Harpoon is designed to be an open-ended gaming system, with the first new BattleSet, North Atlantic Convoy, available now. A BattleSet Editor, which allows you to customize different scenarios, should also be out by the time you read this. The GIUK BattleSet included with the basic Harpoon program includes thirteen different scenarios, ranging from very small engagements to conflicts involving giant modern naval armadas.

Many small touches have been added to make this an enjoyable game to play. The game saves the options you've chosen, so each session can be played under the same handicaps (or advantages). You can also pause or save a game at any point. Hard drive installation couldn't be simpler—just drag the drawer into the partition or directory where you want it. Harpoon is supplied on two disks and uses no copy protection of any type. The game behaves very well in a multitasking environment, and requires one megabyte of memory.

If you have had your fill of standard "blast-anything-that-moves" arcade war games and want to test your strategic thought processes, pick up Harpoon. You won't be sorry.

•AC•

Enhance the speed of your hard disks and floppies

Quarterback Tools

by John Steiner

Volume Work has a read/write error... These words can strike terror into anyone who owns an Amiga. If you have had your machine for any length of time, you've probably run into this message. If you haven't, consider yourself lucky. The problem can be especially disconcerting if it occurs on a hard disk. Quarterback Tools from Central Coast Software was designed to solve a myriad of disk problems such as this. The program also has the ability to fix disk-related problems caused by lockups and system crashes, an unexpected power outage, accidental file deletions or formatting, and even physical disk damage.

Other major features of Quarterback Tools include the ability to restructure the layout of your data files in order to optimize organization on the disk. You can even retrieve a file or files that have accidentally been deleted. The program can also scan a disk to look for defective areas (referred to as bad blocks), which can then be marked and taken out of service.

The QT manual divides program operation into four major areas. First there is "Volume Information", which provides statistics (see Figure One). In this section, virtually every important statistic regarding a disk volume is covered. Second, there is "Problem Correction", which enables the user to repair corrupted disks,

find and mark bad blocks, and retrieve accidentally deleted files. "Performance 2.0, and uses both the old and new AmigaDOS filing systems.

You can put Quarterback Tools on your hard disk or a floppy disk by simply copying the program into an appropriate drawer. The program disk even includes two sets of program icons, one that looks good when using Workbench 1.2 or 1.3, and one that looks good under Workbench 2.0.

Once you have started QT a screen will appear displaying available volumes from which you may select. Once a volume is chosen, the Main Menu screen appears, providing a concise listing of the

program's main features. QT's major designer, George Chamberlain, has thought out many details very thoroughly. You can even choose to disable AmigaDOS while using QT so you can troubleshoot floppy diskettes that are so badly corrupted that AmigaDOS crashes when you insert them in a floppy drive.

QT can defragment files, a feature that has long been sought from an Amiga diskette utility. File fragmentation is a major reason that disk drive performance appears to deteriorate over time. The reason for file fragmentation is that disk operating systems are designed to use every bit of disk space available. Newly formatted diskettes exhibit little, if any, fragmen-

tation. When you add files, delete files, and otherwise change diskette structure, you create small areas in the disk structure where files may be placed. To use space efficiently, the DOS uses these small spaces, sometimes breaking newly saved files into several different sections that fit into several available areas. However, files that are split in this fashion take extra time to load.

QT will display disk and file fragmentation in a screen labeled "Space Usage Map" (see Figure Two). The black areas of the map are areas currently being used, the lighter areas in the image display available space. The fragmentation check also produces a report that identifies the number of fragmented files and number of free space segments.

The QT manual and the program both provide stern warnings regarding the need to make a current backup before beginning the defragmentation process. If the computer should crash, or you should experience an unexpected power failure during this process, your hard disk volume will be hopelessly disorganized. The only solution for a catastrophe of this magnitude is to reformat the drive and restore from your backup set. Needless to say, if you don't have a current backup set available, you could be in serious trouble.

Drawing from personal experience, I would not recommend multitasking while performing this function. I was executing a reorganization of one of my data partitions and, anxious to finish another project, I started another application. It crashed shortly after I started the program, before QT had a chance to finish its defragmentation. When I rebooted the drive, it was seriously disorganized and many files were incomplete or out of place. I ended up reformatting the drive, and had to restore the drive from my backup set. Whether I just had a visit from our friend Murphy, or if QT was somehow responsible for confusing the application I was running, I'll never know. There are times when it is not a good idea to multitask on the Amiga, and I have come to realize

that one of those times is when you are defragmenting a disk.

The third menu item, "Restore", allows for the restoration of deleted/lost files and drawers. When you select this item, you are asked the name of the file you wish to restore. You can either type in the name of the file, or press ENTER if you don't remember its name. If you press ENTER, a screen displaying a list of all files on the disk will appear. Files that have been deleted but which are still restorable are highlighted. You may deselect any files you wish to remain deleted, and select the volume upon which you

diately prior to the reformat. If you later discover that you accidentally reformatted the wrong disk, you can simply use QT's Unformat capability to restore the disk to its former self. The Format utility also scans the disk for bad blocks and marks them in use, thus allowing you to use a diskette the AmigaDOS FORMAT command has found to be defective.

Unformat can only work completely on freshly reformatted diskettes. According to a warning in the manual, if anything has been written on a diskette since the time it was reformatted and you then wish to unformat it, you may have lost one

The manual provides several helpful tutorials and is clearly written and equipped with a fairly complete index.

wish to restore the file. I experimented with this section of the program several times, and found it to work properly in every attempt made.

The "Volume Repair Menu", the fourth menu choice, can locate and mark unreadable blocks on a disk so that AmigaDOS won't use them. It also allows you to scan the disk for defective files or drawers, even repairing them in many cases. As the program locates each bad file, it presents a requester that notifies you of this fact. Minor problems are fixed with no loss of data, while major problems can be fixed but likely with a data loss. Some major problems are irreparable, however, and a warning is provided of QT's inability to recover a file or drawer if it indeed finds such an error.

"Format Volume" and "Unformat Volume" are the final two major program functions. The safe format option in QT actually only rewrites the directory blocks on the disk to make AmigaDOS "think" the disk is empty. At the same time, it creates a file that contains the directory structure as it existed on that disk imme-

diately prior to the reformat. If you later discover that you accidentally reformatted the wrong disk, you can simply use QT's Unformat capability to restore the disk to its former self. The Format utility also scans the disk for bad blocks and marks them in use, thus allowing you to use a diskette the AmigaDOS FORMAT command has found to be defective.

Unformat can only work completely on freshly reformatted diskettes. According to a warning in the manual, if anything has been written on a diskette since the time it was reformatted and you then wish to unformat it, you may have lost one or more of the old files, and you will lose all of the new files stored on the disk.

QT includes a manual that contains valuable information on file storage under AmigaDOS. The manual provides several helpful tutorials on such topics as "Why does my disk drive seem so slow?", "Disk errors", "Disk formatting", "How can a deleted file be restored?", and "How are files stored on a disk?" The manual is clearly written and is equipped with a fairly complete index.

Another program provided on the QT diskette is "QBSNAP", which runs only from the CLI, but can be placed in your startup-sequence or some other script to take automatic "snapshots" of each disk drive on your system. You can also schedule it using a timer program to provide snapshots of your drives at particular times of the day. If you take a snapshot of your hard disk on a regular basis, you can use the Unformat capabilities of QT to restore the drive to the same condition it was in when the QBSNAP program was executed. Also supplied is "CRON", a public domain program that can automatically ex-

Figure One:
QB's Volume
Statistics window

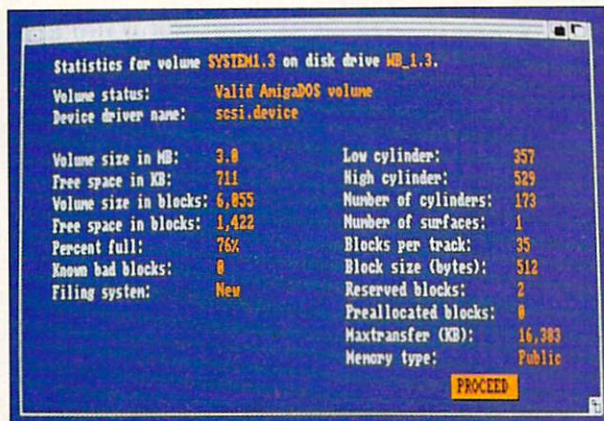
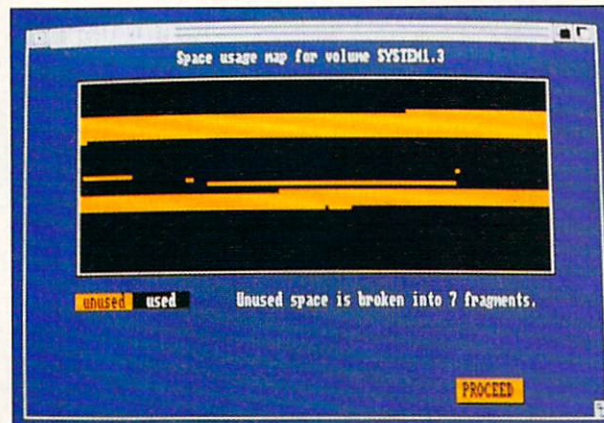


Figure Two:
Displaying disk and
file fragmentation



ecute QBSNAP at specific time intervals. QT can also be run from its ARexx port.

The disk contains other very useful public domain disk-oriented utilities as well as several extra programs. A trouble report form is also included should you be required to call CCS technical support. You can either mail or FAX the form, or transmit it to their BBS. I recommend that you print out this form and keep it handy before your system crashes so that you have it on hand should disaster strike.

Original releases of Quarterback Tools contain some major problems. Make sure the version you use is at least version 1.3c. Earlier versions have various bugs that could cause major problems. Central Coast Software has been very good about keeping users up to date—even allowing them to download the latest versions from

the CCS BBS system. At the same time, I can't help but feel that they rushed this program out before it was thoroughly tested.

The version I am currently using appears to function properly on my A3000 and on my A2000 with 2090A controller card. An earlier version didn't work properly with my A2000 with 2090A hard disk controller, for example. The 2090A is commonly found in A2000 computers, and the program should have been tested more thoroughly on systems with this configuration. I cannot make recommendations one way or another about the use of Quarterback Tools on any but the two machines I own, as it is possible that there could be problems when using the software with some third-party hard drives and controllers. Given the critical nature

of this software, I cannot recommend strongly enough that you make sure you have completely backed up your hard disk, no matter what configuration you are using. I would also strongly recommend testing the program thoroughly on your system if your hard disk controller is not mentioned specifically in their documentation as having been tested. [Central Coast Software has stated that Quarterback Tools version 1.3d works with all Amiga hard disk controllers and hard disk configurations—Ed.]

On the positive side, the program has rescued me from disaster on two occasions. The first time I used it, an application I was running crashed while writing to my hard disk. When I rebooted, I had a "Key Already Set" error on my hard disk. QT's "Repair Bad Volume" went through the disk quickly, repairing all problems that had occurred. On another occasion, I used QT to restore a file that was accidentally destroyed using the AmigaDOS wild cards (DELETE DF0:#?). I had meant to delete the files on df2:, and instead destroyed files on the wrong floppy. This one particularly important file restored was well worth the purchase price of the program.

Central Coast Software has a reputation for developing high-quality disk utilities, and their programmers are well-versed in the AmigaDOS filesystems. They have built their reputation with products such as the hard disk backup utility Quarterback, and file transfer utilities DOS-2-DOS and Mac-2-DOS. Quarterback Tools is a powerful addition to their product line that might just save your data from accidental destruction.

•AC•

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NewTek's Video Toaster

A NEW ERA IN AMIGA VIDEO

by Frank McMahon

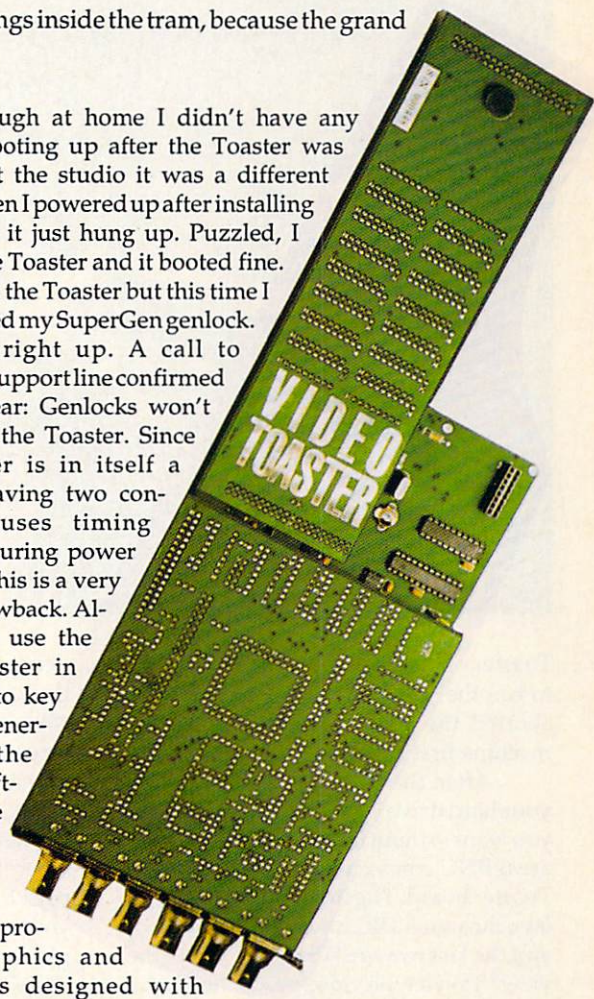
A NEW ERA IN AMIGA VIDEO? Kind of a bold title—but then NewTek's Video Toaster is kind of a bold product. A do-all piece of video hardware that dazzles the senses. But does it deliver all it promises? Over the span of a month I used the Video Toaster at home and in a cable television studio. With it I've been both dazzled and puzzled. I've witnessed some of the most incredible accomplishments ever to come out of an Amiga. I've also learned firsthand of some of the Video Toaster's drawbacks. The Toaster was announced years ago by NewTek and quickly became *the* premiere piece of Amiga Vaporware when it didn't ship. Just what *were* they working on in their top-secret labs? Well, the Toaster is now out, available, and in use. Sit back, relax, and keep all personal belongings inside the tram, because the grand tour of the Video Toaster is about to begin.

INSTALLATION

The first thing to do is to install the board inside your Amiga 2000/2500, since the current version of the Toaster only works inside those machines. An Amiga 3000 version is promised and, as far as using it on the 500, it's not possible now.

Installation is pretty straightforward. The Toaster comes on one multilevel board and fits neatly into the video slot inside the 2000 (that's the slot on the far right next to the internal disk drive). The only problem is you need to unscrew your power supply chassis and lift it slightly to slide in the Video Toaster board. Not a big deal; I had the board installed in just under 10 minutes. I tried it under 3 different configurations: at home with a stock Amiga 2000 with 4 megabytes of 16-bit RAM, at home hooked up to a 1/2-inch Super VHS editing system (2 Panasonic AG-1960s and an AG-A95 Edit Controller) with an Amiga 2000, 68030 processor, 8 megabytes of RAM (4 meg 32-bit/4 meg 16-bit), and at the cable TV studio with an Amiga 2500, 68030 processor, and 5 megabytes, running into an A/B roll edit system with Sony 3/4-inch SP 9800/9850 decks, and a Panasonic Edit Controller. As for video inputs at home, I plugged in a Panasonic AG-1960 S-VHS deck, Pioneer CLD 2070 Laserdisc Player, and a Sony CDD-F35 8mm Camcorder. At work I used our Sony 9800's and Panasonic cameras for source material.

Although at home I didn't have any problem booting up after the Toaster was installed, at the studio it was a different matter. When I powered up after installing the Toaster it just hung up. Puzzled, I took out the Toaster and it booted fine. I reinstalled the Toaster but this time I disconnected my SuperGen genlock. It booted right up. A call to NewTek's support line confirmed my dark fear: Genlocks won't work with the Toaster. Since the Toaster is in itself a genlock, having two connected causes timing problems during power up. To me this is a very serious drawback. Although we use the Video Toaster in the studio to key graphics generated by the Toaster software, we still need a way to fade up previously produced graphics and animations designed with

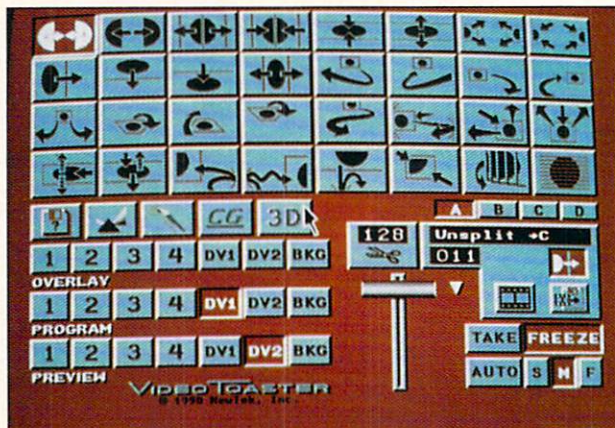


other programs such as DeluxePaint III and ANIMagic. The thought of taking the Toaster out every time we need to do that is pretty scary. Now the Toaster itself provides a genlock that is automatically enabled when you exit the Toaster software. However, there is no fade control and no way to turn it on or off. For now there is no way to correctly control the Toaster genlock. Remember, this is the genlock option outside the Toaster software; the actual Toaster program can do amazing effects from within.

Installation of the software is easy. Just double click on the "Installation" icon on the first Toaster disk (there are 8 disks total) and everything is moved to your hard drive. A hard drive is required and you'll need about 7 megabytes of free space as well as quite a few megs more to store frames to disk (each still frame is about 700K). Installation can either configure the software to be accessed from the Workbench or to autoboot the Video

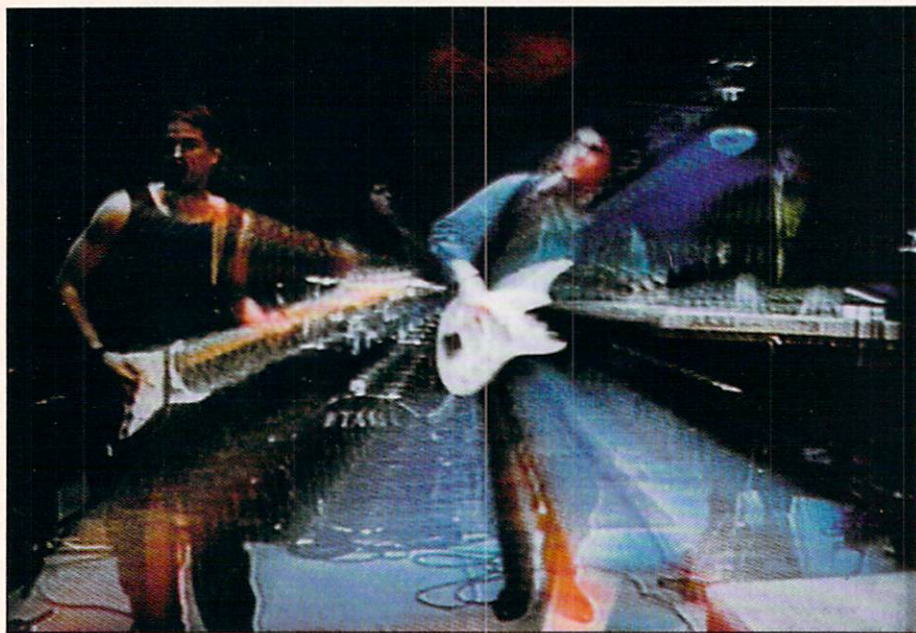
Right: The Video Toaster's Main Control Screen.

Below: The rock group "Graphic Moves" literally earned their name in this Video Toaster rock video.



is the next shot to appear. You set up your effect, graphic, or image on your Preview screen and, when ready, "take" it and send it to your Program output. Program is what is being recorded on tape.

The Toaster uses the RGB Amiga screen as well for those who prefer to work in RGB mode (especially helpful in



Toaster command screen. I was also able to run the software from the CLI when I aborted the startup-sequence when the machine first booted up.

After the program is installed on your hard drive you can then decide what you want to input into your Toaster. There are 6 BNC connectors on the back of the Toaster board. The first 4 are video inputs (synchronous TBC inputs are suggested), and the last two are "Program" and "Preview". Preview, in video production terms,

detail work such as painting). However, the RGB Amiga output is limited to only 4096 colors, so the preview screen will actually allow more colors in sections such as that of ChromaFX (discussed later). So you can use a 3-monitor system (RGB-Preview-Program) or a 2-monitor system where the command screens are "ghosted" over the Preview output. With the latter you are not limited by the Amiga's display and are able to see your preview shots.

The Toaster will take a number of TBC preferred video sources from VCRs, laserdisc players, and cameras. TBC (short for Time-Base Corrector) is a unit that typically strips away the sync signal of a video unit and replaces it with a clean, consistent, error-free video signal. [Editor's Note: Although low-cost TBCs are predicted, current pricing is at \$1,000.00 to \$3,000.00 for a TBC.]

Most TBCs require another piece of equipment to work properly: a black burst generator. This provides a constant video signal which the TBC syncs with the incoming source. It then outputs a solid video signal that is error-free.

Think of when you get your car's tires aligned. If all tires are not perfectly computer-aligned and in sync, your car will pull to one side or one tire will wear more quickly than the others. VCRs are the first to run off the road. Because the head drum is constantly moving across the videotape, and other variables such as slight speed changes exist, the VCR must run through a TBC before it can run through the Toaster. I gave it the old college try with my Panasonic AG-1960 and it didn't work.

However, laserdisc players and cameras are more encouraging. They both "drive" a consistent, straight line (you can plug them directly in with little difficulty) although they are moving at "different speeds". So if you plan on driving ...er... plugging in two cameras or laserdisc players (or two VCRs), they must run through a TBC so that both are in sync and traveling down the video highway side by side to deliver a consistently good picture.

You're not limited to two of any of the above, of course. You may have up to 4 video TBC-synchronous inputs at any time running into the Toaster. In fact, you

don't have to have any video running into the Toaster if all you want to do is NTSC painting and 3-D modeling.

MEMORY REQUIREMENTS

Since the release of the Toaster I've heard of different memory requirements from a host of different sources. Initially it was stated that 3 meg would be required. Then it was officially 5 meg. Now it seems 7 meg is the "ideal" configuration.

Well the more memory the better. I've tried it at 8 meg with a 68030 and it purrs like a kitten. I've also tried it with 4 meg and, to my surprise, most of the program worked with no problem. In fact, the only drawback was that I could not enter ToasterPaint. I then tried it at 5 meg, which is the required amount. This time I had access to the paint program; however, I

C-D) which hold 32 effects each for a total of 128 transitions. Right below that are 5 icons for Toaster Preferences, ChromaFX, ToasterPaint, Toaster Character Generator, and LightWave 3D (and Modeler). Clicking on these either loads that part of the program into memory (so a second click lets you immediately enter) or lets you go directly into it.

On the lower left portion of the screen are the Overlay, Program, and Preview video source selectors. Each row contains 7 icons: the first 4 let you select any of the four video inputs, the second two correspond to the two framebuffers, and the final one is a background. Program and Preview are used for setting up shots and sending them to your record deck.

The Overlay is for luminance keying. Luminance keying places an image

To the right of the video source selectors is a T-bar slider that is controlled with the mouse. This is a slider (like any switcher) that lets you control the transitions manually or to produce split-screen effects. To the right of that are option icons to load frames, character generator screens or effects. Below are icons to "freeze" a frame of video, as well as those for Take (a straight cut from one video source to another), Auto (allows automatic control of the transitions), and a speed (slow, medium, fast) panel that controls how fast the transitions take place.

DAZZLING TRANSITIONS

How do they look? Well, good news and bad news. The good news is that they look stunning. They are incredibly smooth-moving and switching from one video source to another is as easy as hitting an icon or sliding the T-bar with the mouse. Years ago, NewTek demonstrated effects such as wrapping an image around a sphere in real time. However, the current effects are all two-dimensional.

The types of effects are numerous. "Push/Pull" is similar to wipe, except the image pushes the current image off rather than overlaying on top of it. In "Squeeze/Zoom" the image pushes back into infinity—sometimes with duplicate images surrounding it—or zooms right toward the viewer, reversing when the entire screen is a blow up of a single pixel.

"Split" splits the program signal along an axis and reveals the preview signal beneath, sometimes with the two sources traveling in opposite directions. In the effect "Tumble", the signal flips around on a horizontal or vertical axis following a predetermined path and sometimes includes trails.

With "Trajectory", an image flies around via a path with compression (aspect ratio intact) to simulate depth. "Swap" is similar to a split, but the two halves of video cross over each other. "Blinds" have added features, such as every other blind heading in the opposite direction. "Mosaic" causes the pixels to increase in size and, unlike zoom, makes each expanding tile the average color of all colors in the original image as the effect progresses over a specified time (sure you can read it again...I'll wait).

"Tiles" changes the program image into smaller tiles of the same image. "Compression" differs from zoom, the aspect ratio is not retained as the effect

The good news is that the luminance keying on the Toaster is excellent. It's easily adjustable with the mouse (via a numerical slider), and you have the option of keying over the darker or the lighter parts of the picture.

didn't have access to the swap screen and couldn't pick up very large brushes. Personally, I find it pretty tough to paint without a swap screen especially since ToasterPaint has no background fix (to allow one to work "over" the picture).

Seven meg will allow larger brushes as well as a swap screen. You will even be able to pick up an entire screen as a brush. Also, more memory will let you have more parts of the other Toaster components in memory at one time. You can swap between painting, 3-D modeling, and the character generator without loading the section each time.

For those with limited memory there is a "Get Small" option which dumps everything from memory except the essentials. For example, it flushes out all the digital effects (except fade) to provide more room for whatever section you choose to enter. As for ideal memory, I would have to say 7 meg. It's enough, plus there's some breathing room.

TIME TO TOAST!

The main Video Toaster screen has 4 rows of effects in the top half of the screen. There are 32 effects on screen at once in selectable icons. There are 4 banks (A-B-

for example, a still frame) over the dark or light parts of the picture. This is similar to "chroma keying".

Luminance keying was used in the earlier days of television to superimpose, say, the weatherperson over the weather map. The man or woman would stand in front of a completely white screen, and the map would be "keyed in". Some of drawbacks of this method were when the person turned, light often bounced off his forehead or, when the lighting was too bright, some of the map might be visible "through" the person. Also, due to the lighting (especially back lighting), the person's outline could appear fuzzy.

Chroma keying was eventually developed and solved problems associated with luminance keying by using a certain color (usually green or blue) for the background, using the chroma level in a color for the key source. This is not to say luminance keying is old-fashioned. It just takes more trial and error than chroma keying. The good news is that the luminance keying on the Toaster is excellent. It's easily adjustable with the mouse (via a numerical slider), and you have the option of keying over the darker or the lighter parts of the picture.

progresses (usually compressing toward a fixed axis). In "Fades", images fade in as the effect takes place. "Trails" is a dazzling effect that causes a trail of images (fading over time) as the image moves. "Fade In/Out", which provides a smooth 3-speed fade from one image to the next, is the most oft-used production transition (after take).

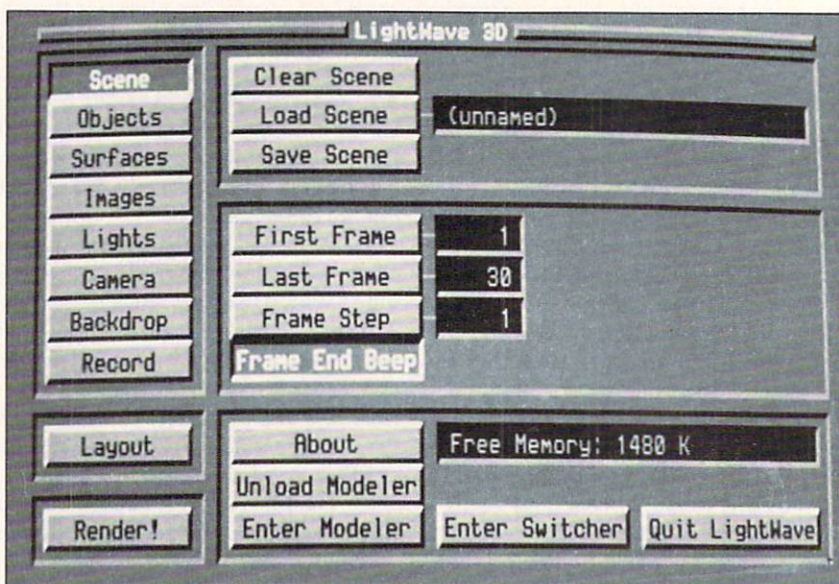
The bad news is that there is pixelization when an effect goes "away" (shrinks or is compressed) from the viewer. The reason this happens is the effects are processed through the framebuffers. Since these are hi-res boards with limited resolution, shrinking a full-screen image makes it impossible to maintain the same resolution (similar to any Amiga paint program).

There are several ways to avoid this. First, not all of the effects use compression. Second, the ones that do can be set to fast or medium speed and you should not notice the pixelization. Only on slow speed will it become apparent. Another drawback is the inability to create your own transitions. It sure would be nice to combine or edit the existing group.

THE SWITCHER TEST

The true test came last week at our cable studio. I decided to bypass our house switcher and direct the show completely with the Video Toaster. I had my fingers crossed since the program was "live-on-tape", with little room for error.

The first thing I noticed was that we usually fade up from the commercials slower than the Toaster does. Even its slowest speed was a little too fast. Since I



it loaded in on the upper left-hand corner of the screen. Since the 2500 in our studio has only 5 meg, it was impossible to pick the logo up as a brush to center it.

Realizing I would have to add our logos later, we began the show. First up was a rock band. As you might expect, a flurry of special effects transpired. I quickly used one right after another. Once in a while I would click a complex transition and there would be a 1-2 second delay which the program used to set the effect up in the framebuffer. I saw this on the preview screen as well (the screen usually blanks and flickers every time something is loaded into one of the buffers). This happened probably 3 times during the

The manual suggested feeding the Toaster with advanced sync in order to time it back into everything else in the studio that is running on house sync. The manual points out the first input on the Toaster should be used as a reference signal, with every other input synced to the first source. The drawback being there really isn't a true sync signal input that's separate from the video inputs. [Editor's Note: In this configuration, your possible video inputs will be reduced from 4 to 3 unless the reference signal is also a video source.]

Now I realize I'm losing more than a few readers, but if you want to use the Toaster to its fullest potential in a "Prosumer" atmosphere, it can get pretty expensive. Also, I have not even touched on calibration equipment to adjust the signals (such as waveform/vectorscopes). The basic fact is if you have a complete studio/cable station already, the Toaster is a dream come true. If you are using camcorders and home decks, you'll need more equipment.

Of course, with any video production effect generator, moderation is the key. Overindulgence in the Toaster's many effects can cause eyestrain. The rest of "Cafe West" consisted mainly of cuts and dissolves, during which the Toaster performed flawlessly.

Even though the take (cut) button is on the main screen, the dissolve button should be right next to it (instead of in the effects bank above). With most video productions those two will get the most

Of course, with any video production effect generator, moderation is the key. Overindulgence in the Toaster's many effects can cause eyestrain.

had to unhook my SuperGen genlock in order to get the Toaster to work, there was no way to load in and insert (fade up/down) the 20-page DeluxePaint III animation that held all our logos.

I had made an attempt to load some of our "station break" logos into ToasterPaint. That way I could create a frame and key it over. Well, ToasterPaint only supports overscan/hi-res, so when I loaded in my 640 x 400 logo for "Cafe West" (see tutorial of this logo in the December 1990 issue of *Amazing Computing*)

song. I'm not sure if it was the speed, the fact that it just needed the extra time for that particular effect, or that it was running on the minimum memory configuration. Whatever the reason, it in no way affected the program output. I also noticed some horizontal shifting and slight pausing with a few of the effects. The manual indicates there is a 400ns delay from video in to program out. Putting the Toaster into an existing studio with an existing switcher caused a problem.

use. Getting smooth results when fading or dissolving with the mouse (T-bar) takes some practice. For this reason, I have generally steered clear of the T-bar in favor of the auto speed selector.

All in all, the Toaster performed remarkably as a dedicated switcher for the show. There is something comforting about controlling an entire studio production with your Amiga mouse. Of course, it could also be the sheer power.

DIGITIZING FRAMES

I've mentioned frames throughout this article, but what exactly is a frame? A frame resides in the framebuffer, of which the Toaster has two. It can immediately be called up, cut to, faded to, special "effected", and even keyed in. Basically, everything you can do with video sources you can do with frames.

You capture a frame by hitting the freeze button. You can capture a frame from a camera, laserdisc, VCR, or whatever source you have hooked in. It's standard digitizing but there is no "processing" like capturing a red, green, and blue file or converting it to lo-res HAM mode. What you capture is what you get: a full, broadcast quality, picture.

Because a frame is made up of 2 fields (every other scan line), and there is usually motion in it, the Toaster has a "Motion Removal" option that quickly gets out the "jitter" with no sacrifice of quality. The Toaster actually grabs four fields so it can get the full amount of resolution and color fidelity. There is also a way to grab eight fields in a single image to produce a short 4-frame looping moving image. It's pretty neat, although I'm not too sure if it's useful.

A frame can be loaded in ToasterPaint and manipulated. The power to grab a full hi-res, overscanned freeze frame off video and load it into the paint program with 24-bit color is an amazing advance I'm still trying to get over. Sadly, the more I work in this mode, the more the standard 32-color, lo-res Amiga screen looks like a Commodore-64.

Frames can also be loaded into LightWave 3D and mapped on objects. Now we're talking power. Your 3-D tabletop won't just look like marble, you'll swear it *is* marble! The resulting rendered 3-D picture can be saved as a frame so you can bring it right into the switcher. Images can be created in ToasterPaint, LightWave 3D, or the character generator, and can be

saved as frames and manipulated with the switcher's digital effects. Speaking of ToasterPaint, you can load just about any standard Amiga graphic into the program—from lo-res to HAM to overscan to RGB 24-bit files. Once loaded, they can be saved as frames to bring into the switcher.

Toaster press releases claimed "1000 frames" frame storage. Well yeah, but that's 750 megabytes of storage, quite a big hard drive. Since each frame is large (710K or 7/10ths of a megabyte), set aside plenty of hard disk space if you want to save a lot of frames. A good thing about the size is that a single frame will fit on a floppy disk for permanent storage or backup.

TOASTER PREFERENCES


From the main command screen you can enter the Toaster Preferences section. This allows you to have control over various settings. The top of the screen contains rows of color boxes: the top row lets you select your background color and the bottom row lets you choose your border

color. These colors will appear when you execute certain effects through the switcher.

The colors are predetermined. One "color" is "video noise", sometimes known as "snow". Buttons are also included to terminate any input (1-4). There is also a GPI trigger adjustment, used when you are timing the Toaster to an external device. This provides frame accuracy with such components as editors and frame controllers.

The Project Window lets you load and save projects. Some Toaster users will skip over this feature but it's very important. You can save your entire setup—for example pages from the CG, certain effects, input-output devices for framestore—in a file. You can later boot up with just what you need. You can even create your own tailor-made default settings.


Earlier I mentioned a "Get Small" project that is included. This is a good example of memory saving by booting up the Toaster with only the fade command




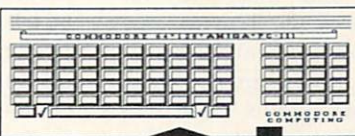
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Pool of Radiance
Check Mate
Over Run
Second Front











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rather than all 128 effects. An option is included that lets you load in a "CG book" for immediate use (we'll go over those later). Device button icons are for changing where the default save/load paths should be on the project/framestore.

Motion removal and the ability to choose 2 or 3 monitors are also included. With 2 monitors, the Toaster ghosts the command screen over the Preview monitor. Finally, there is an "Exit" button to shut down and exit the Toaster software. The overlay genlock is activated upon exiting, putting your Amiga screen (minus color 0 or background) over whatever video input you had selected on the Program bus previous to exiting.

THE MANUAL

Before we dive into the individual "slices" which make up the Video Toaster, let's take a look at the manual. Actually it's pretty hard to miss it. It's several inches thick, comes in a hard-cover, three ring binder, and with more than 650 pages. The manual is very easily digested and is broken up into separate tutorial and reference sections for each program. You're really getting 6 programs in one, so the page count is about on par.

The manual includes a section on expanding the Toaster system with tips on picking out expansion RAM, accelerator cards, and hard drives. A full array of keyboard commands (seems like just about every key is used at some point in the programs) is listed. NewTek also lists some compatible VCRs and camcorders (Hitachi VL-S100, Sony CCD-V5000, Sony EVO-9700) which have built in TBCs.

Brief sections on single-frame controllers, suggested reference material, phasing and troubleshooting, error messages, and a 9-page video glossary are included. Programmers will be happy to know that the Toaster is ARexx-compatible; however, the port only allows you to control or send commands that the Toaster can do itself, and not alter or edit different commands, effects, or features. On the

whole, the manual is very well laid out and very easy to read considering the huge amount of information contained.

TOASTERPAINT DAZZLE

I was probably most interested in the paint section of the program. For those familiar with Digi-Paint 3, you'll be right at home. Aside from a few changes, this IS Digi-Paint 3 (NewTek's HAM paint program) converted to work with their 24-bit cards. All painting takes place on the Amiga screen in typical HAM mode. At any time during the session you can hit the "Render To Program" icon which sends the 24-bit information (calculated internally) to the Program framebuffer.

When you first hit this icon the entire screen is sent. After that, only the changes are sent, which means that if you draw a box and hit the render icon, only the box is sent to the framebuffer. This is an excellent timesaver. There is even a "Continuous Render" command to constantly send out changes.

Since there is only one resolution mode (hi-res overscan 736 x 480), you cannot see the entire picture at once on your Amiga monitor (you can see the final result on your Program monitor at all times). You actually see about 1/4 of the "big picture". To paint, the canvas "autoscrolls" when you move your mouse, like a super bitmap image. Coordinates tell you where you are as you move and the autoscrolling can be paused or disabled for manual scrolling.

You can switch to "1x" mode, which shows the whole picture on your Amiga screen at one time by skipping every other pixel. However, this incurs severe limitations, and most of the essential tools—such as Scissors, Texture Map, Text Rendering, Brush menu, Effect menu, and Swap Screen—are disabled. The limits exist because if you, for example, stamped down a brush it would only stamp down the image on every other pixel. When you switched back to normal autoscrolling "2X" mode, a checkered mess would result.

VIDEO TOASTER UPDATE!

If you already own a Video Toaster, no doubt you have the version with a white covered manual, the manual that lacks pictures. Well, NewTek is now shipping V 1.0 of the manual/software and it's a modest update, but none the less worth noting.

First, the black binder edition contains pictures not in the earlier release. Confusion caused by a lack of pictures in some areas (especially ChromaFX) is now nonexistent. The new version contains a warranty card and stickers to label the 3 monitors as well as to label the BNC connectors on back. A new program, "AutoHue", has been added. It syncs up the color information of the Toaster effects with the incoming video so there is no phase shifting.

There are only a few additions to the software side of the programs. Frame loading/saving can now be done by mouse control (a big plus). The Toaster Preferences now shows numerically how many frames you can save on your storage device (e.g., a hard drive). The take (straight-cut) effect on the main switcher screen has also been added to the effects bank.

The other alterations I found were mainly in LightWave 3D. In the Layout you can now select "All Items" when creating key frames—an incredible timesaver, but I've yet to discover if this fixes the bug that causes the camera/objects/lights to default to the center upon reentering the Layout. Since there is no documentation saying it was repaired in this update, I can't say for sure. (*Editor's Note: A New Tek Spokesperson reported the error was fixed in V1.0*)

Other improvements to LightWave 3D include a new "Letterbox" rendering mode which cuts rendering time by 30%. Unlike Sculpt 4D's version of bars on the top and bottom, this is much more severe (about two-thirds of the screen is black) but can look quite impressive given the right project. I found a new undocumented Shadow option for objects, selectable by "self-shadow", "cast shadow", and "receive shadow". Finally, more of the numerical inputs are now accompanied by numerical sliders. Let's hope all numerical options are "slider-equipped" in the next update.

It's important to note that this is not a drastic upgrade. It's more a light dusting of helpful features. Hopefully, NewTek will try in the future to list all additions to the software in the manual addendum. Most I just stumbled across, and all were so good they deserve better recognition! Contact NewTek directly for information on upgrading to Version 1.0. —F.M.

Most of the traditional Digi-Paint 3 features are here. Color selection is done from an on-screen palette of 4096. There is a 16-color color strip which can be altered and changed to form your "base" colors. Ranges can be created to perform gradient spreads according to the balance and distribution of the transparency controls. Transparency lets you adjust the level of transparency on the edges of a drawn object, or of a user-controllable "hotspot".

Horizontal and vertical hotspots can create patterns such as skies. Tools include: Freehand, Freehand Continuous, Polygon/Straight Line, Rectangle, Circle, Ellipse, Fill, Flood Fill, Brush Size Selector (with 7 different size brushes), Undo, Redo, Scissors, Magnify, and Grid.

Redo in itself is very powerful in that you can draw an object in one color and, if you change your mind, choose another color then Redo. Redo has limitless possibilities with other parts of the program. On the unfavorable side, the text rendering control is just as bad as it is in Digi-Paint 3.

Any Amiga font can be selected, but not previewed; styles such as bold, italic and underline are featured. There is a smoothing option to help get rid of the jaggies. There is no editing; to create text you must type the words into the "text entry window", hit return and the text then becomes a brush which you must manually position.

Smoothing is also available when stamping down brushes (via the texture map) using 16x oversampling. Tile and wrapping controls let you wrap brushes around objects (such as spheres) or create a tile of pictures. As stated earlier, nearly any Amiga graphic in any resolution or mode can be loaded in including freeze frames grabbed from the main Toaster screen.

If you want to use your HAM interlace pic with the Toaster digital effects, you'll first have to load it into ToasterPaint and then save it as a "frame". Printing is done via 12-bit print. Each of the 8-bit red, green, and blue (24 bits total) values are dithered to 4 bits each (12 bits total) before printing. Standard brush tools include Load, Save, Flip Horizontal, Flip Vertical, Rotate 90 degrees, No Background, Swap, Exchange Brush, Restore Brush, and Copy Brush.

Via the Mode menu, you can adjust shape tools, brushes, and text. Effects include Color Range, Lighten, Darken,

Colorize, Rubthru (to swap screen), Blur, And, Or, and Xor. Simulated perspective can be achieved through the horizontal wrapping controls.

There is no true perspective command, and using this method is fine but usually provides mixed results. ToasterPaint is also ARexx-compatible. The manual contains many tutorials including—yes, you guessed it—how to take a picture of a beautiful young woman and put an eye on her forehead! I'm glad the people at NewTek decided to get into Amiga programming rather than genetic engineering.

There is one big problem with ToasterPaint: the autoscrolling. It's like painting on a billboard while wearing roller skates. It's difficult to get used to and I can only hope that further programming will get the whole picture on-screen with all tools intact. Also, since most video output requires extensive use of titles, the

Right:
A scene
created with
Allen Hasting's
LightWave 3D



text-rendering section of the program really needs an overhaul.

As for good news, the output is gorgeous. Smooth color ranges, clouds, mist, colorizing, special effects, smoothing, all in overscan hi-res look nothing short of outstanding. Forget the TBCs and cameras. Buy a Toaster just to paint with! Check into IBM and Macs. It costs a lot more than \$1595 to digitize, paint, and encode to video in 16 million colors.

CHROMAFX

The ChromaFX program can be best understood by photographers. It is basically 32 pre-made effects plus an editor to modify these effects or create your own. These effects are the video equivalent of "filters". Placed over the video these real-time effects can colorize, posterize, color cycle, tint, produce negative video, rainbow strips, and much more. While most effects in the Video Toaster enhance the program output, ChromaFX effects are "over-the-top" color splashes. Used sparingly they are quite effective but overused they can become too much.

All the effects apply new colors to the incoming video signal based on the luminance (brightness) level. The top of the screen contains an Effects Selection Box which allows you to scroll through all 32 pre-made effects. The Palette Map is a large dark-to-light color spread which directly effects the video output.

For example, suppose you wanted to tint a sky red for a sunset effect. You would create a black to red spread in the palette map. Red would be the brightest color, so all the bright colors in the video would be red. The darker colors would be darker shades of red up until black. Similar to a black to white (with shades of grey in-between) palette in a 16-color black-and-white digitized IFF pic. Several tools are available to let you alter and change the palette map, allowing creation of an unlimited number of effects. The Blurred

Transition icon lets you blur the transition between one luminance band and the next. Sharp Transition does the opposite making the bands very defined.

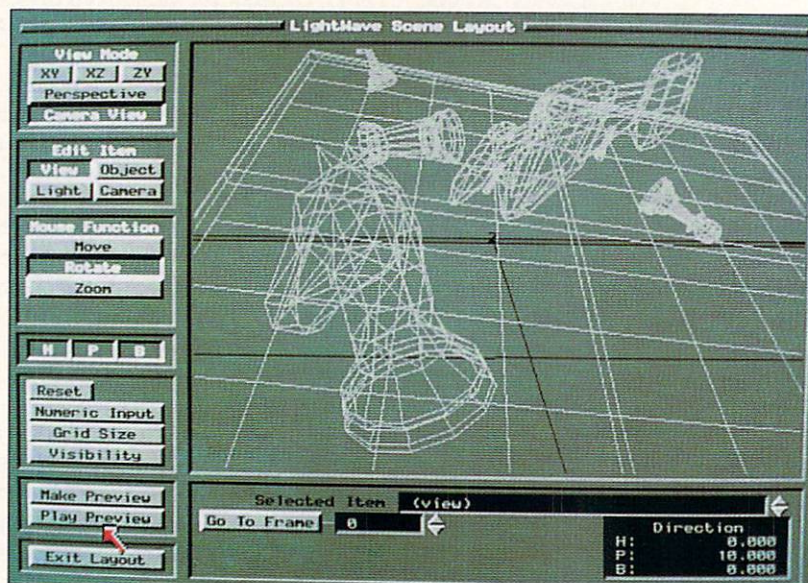
On one side of the Palette Map is the Darkest Box, which lets you set which color will be added to the very darkest parts of the picture. The other side contains the Brightest Box which lets you set the color that will appear in the bright parts of the video. The Palette Marker indicates which color you are currently editing and is used for starting points in creating spreads.

In addition to spreads, you can also create a Spectrum of colors (like rainbow), Random Color, or Snow which is alternating color bars of black and white that resemble a TV receiving no signal. Normal/Negative Video can swap the light and dark boxes for instant negative video effects.

You can Copy or Exchange certain colors and create your own with Red/Green/Blue or Hue/Saturation/Intensity sliders.

There are basically three types of effects ChromaFX provides: Transition, manual control of colorization over time; Filter, applies entire color palette over picture; and Cycle, cycles through the colors at slow, medium, or fast mode. Chroma Stripping takes out the colors from the incoming video before the effect takes place rather than mixing the video palette with the effect palette. A T-bar is provided so you can manually bring in the effects and the standard Toaster "Clapboard" icon sends the effect to the program output.

The 32 built-in ChromaFX effects will probably keep users happy for quite a while, and it's pretty neat to create your own color effects and save them to disk for



The Scene Layout Screen of LightWave 3D

later use. By making every other color in the palette vary wildly, it is possible to create a simulated grainy MTV-like look that's quite striking. There is a slight pause after selecting each color effect while it is set up, but only a second or two and only on the Preview screen.

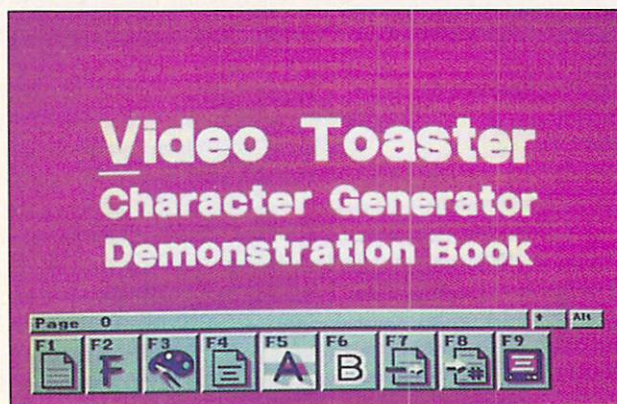
I have been using ChromaFX to create backgrounds. Without colorizing a video signal you can dump the processed color effects directly to the framebuffer for use "behind" your digital effects. Certainly a lot better looking than jet black and the screens come out smooth and very colorful. The only problem with ChromaFX is it's too easy to go too far. As long as moderation is exercised this is a fast and easy way to create beautiful color effects.

LIGHTWAVE 3D

News of Allen Hasting's new 3-D modeling rendering/animation system being bundled with the Toaster came as a nice bonus to the Toaster's many features. For those unfamiliar with 3-D programs, instead of painting on a 2-D screen you create objects in a 3-D universe. Objects and lights are positioned and then a camera is brought in to take a snapshot of the setup. The pictures have real depth complete with shadows, and the end result is usually startlingly realistic.

In LightWave's main control screen, scenes which contain the positions of objects, lights, the camera, and any motion paths can be saved and loaded. Controls of the frame recording are also included. You can specify the first frame and last frame to be rendered as well as a frequency to render, every third frame for example. One drawback is that all animation (with the exception of wireframe preview) must be done via a single-frame controller hooked up to a frame-accurate deck (which records a frame at a time directly to tape). This equipment is more industrial than "prosumer" and, as expected, it is quite expensive (hope is on the horizon: new Super VHS decks with computer-controlled digital frame location/editing are expected later this year).

Another way to create animations is to dump all frames directly to videotape and then edit them automatically with an editor that features an edit decision list.



A portion of NewTek's Video Toaster Character Generation

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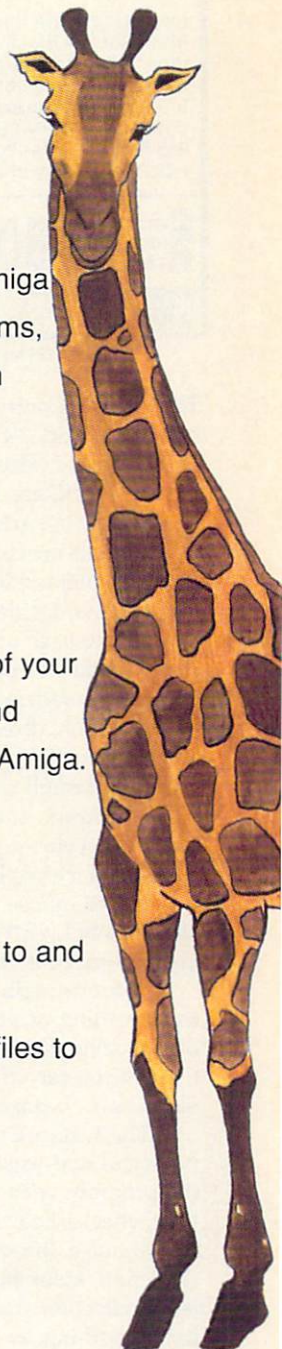
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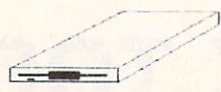
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The Objects Control Panel allows you to save and load 3-D objects. Over 80 (!) objects are included to get you started and LightWave 3D can load in Videoscape 3D and Sculpt 3D/4D objects with no problem. Parents are easily created also.

This hierarchical structure of objects lets the user decide which objects will be attached to each other. This allows complex creation of objects such as human bodies with separately movable arms and legs. Position, direction, and the scale of an object can all be set via typed in coordinates. Although most commands allow numeric input, they also allow manual adjustment via the mouse in the "Layout" screen (which we'll get to in a moment). The use of mouse control over so many elements of LightWave 3D is what sets it apart from most other 3-D programs.

"Metamorph" allows automatic transforming of one object into another during animation. "Dissolve" is similar to the transporter effect on *Star Trek*: your objects can "beam out" during animation.

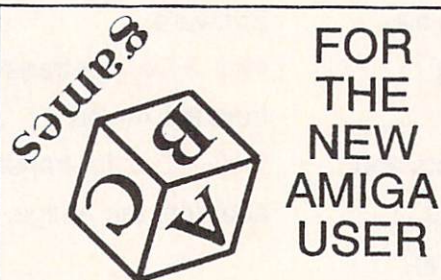
The Surface Control Panel is the most powerful and least user friendly part of the program with surface colors, texture type, checkerboard, grid, wood, marble, fractal noise, luminous, diffuse, specular reflection, color highlights, gloss, simulated reflection, transparency, edge opacity, smoothing, and more. The combinations and possibilities are endless. However most are controlled via numerical input which is a hit or miss system with 2-10 variables for each feature. With some experimenting, the results are impressive.

The main problem is most of the textures are too symmetrical. Real patterns (such as marble) are very random. My favorite surface attribute is image mapping. You can load in any IFF pic (HAM, hi-res, etc.) or a Toaster 24-bit file and "wrap" it around an object. The texture possibilities are endless with this feature.

You can also set the object next to it to "reflect" the image. It is important to note there is no true reflection, it is simply mapped on in reverse with a diffusion setting. The reason for this is LightWave 3D makes little use of ray-tracing. Everything (except shadows) is accomplished with Phong shading. The trade-off is sacrificing some reflective features for fast rendering speed. Bump Mapping allows for a more textured feel to create realistic effects such as rippling water.

Lighting is well done with the ability to adjust amount of lights, ambient light, lighting color, intensity, envelope (intensity animation-ex:sunrises), light motion, shadow rendering, parents, target, direction, point light, spot light, cone/edge angle and fall-off parameter. Full camera control allows motion, target, zoom, color saturation, motion blur simulation, blur length, and linear control. Linear moves the camera (and other moving objects such as lights) in a straight line as opposed to the default setting which moves objects in an arc or curved path.

There are different rendering modes including Wireframe for quick previews, Quick Render which does not include true shading, shadows, or textures, Normal



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and Antialias. Only lo-res and hi-res are available with or without overscan. The glaring omission here is a tiny/medium normal preview such as Sculpt 4D or a selectable "window" preview such as Turbo Silver. If your ground is rendered incorrectly you won't know it until you've rendered almost the entire picture, and, with antialias and hi-res overscan on, this could be quite a while. Lo-res non-overscan is quick but a smaller version of the screen to perform test runs is much preferred.

I tested rendering times in all configurations mentioned at the beginning of the article. On a stock 2000 (4 meg) most simple scenes could be rendered in 5-25 minutes. Adding hi-res, overscan, antialias, and several objects with shadows took 12-15 hours. On a 2500 it was a whole new ball game. Blazing was an adjective that came to mind; most complex scenes could be rendered in 10-55 minutes, with simple scenes coming in at 60 seconds or less!

The Backdrop Control Panel lets you load in an IFF or frame to be displayed in the background or foreground. Foreground dissolve is unique in that it lets you set the transparency of the loaded graphic. Sky, zenith, and ground color are allowed along with Nadir color, which is the color directly beneath the camera. Background fog can be added along with parameters for density and color.

The Layout screen is where you'll spend most of your creative time. It is LightWave 3D's strongest feature and a work of art as far as interfaces go. It is

basically a wireframe preview of your scene complete with camera and lights and a floor grid so you can keep your bearings. You can view your objects from the left, right, above, perspective (wide overview), or how the camera sees the scene.

The big difference here is that all manipulation is performed in real time. No more switching constantly between 3 views. You have a window on a real 3-D world where if you need to move the camera or reposition an object, you just click on it with your mouse and drag and rotate it in 3 dimensions. You can also type in coordinates for the x, y, and z axes as well as bank, heading, and pitch and you change the view by zooming in, or rotating it.

Positions are memorized by setting Key Frames. Once you decide where you want your light for example, click on Create Key. This is also used for animation, which is why this screen is also used for wireframe previews. You can play your previews at different speeds, forward, or reverse. Wireframe rendering is brisk and creating animated scenes is incredibly easy. Reset and Center gets your scenes back on track. The grid size (floor) is adjustable. Visibility allows you to turn off items such as the camera and lights for editing purposes if your scene becomes too complex.

LightWave 3D has only a few problems. First of all every once in a while it forgets key frames. You'll set them, go to

adjust surface attributes for example, then when you return to the Layout your camera, lights, and objects will all be reset to the center of the grid. Very odd and it only happened to me twice in many many hours of using LightWave 3D, I also wasn't able to duplicate the occurrence. [Editor's Note: A NewTek spokesperson stated that this problem was corrected in the update, V1.0.]

The only time I ever crashed any part of the Toaster package (this goes for the Toaster Paint, CG, everything) was in LightWave 3D. I was typing in a numerical input for an attribute and accidentally hit the escape key instead of the number one (I really must stop typing with a rubber mallet). Upon hitting return fireworks started and a pulsating grey screen locked me out forcing a reboot. I realize this was my fault but I did lose my entire scene. (Other than that after weeks of using—and torturing—all parts of the Toaster package, I could in no possible way get it to crash.)

The main drawback of the Layout is there is no object editing (this is done separately in LightWave Modeler) and there is no way to delete an object once you've loaded it into your scene. Not a fault of LightWave 3D but I also can't load 24-bit files I have created into The Art Department without getting jumbled colors. NewTek support confirmed the problem and hopefully a module for The Art Department, specific for the Toaster, is forthcoming.

While these complaints are minor, I have nothing but the highest praise for LightWave 3D. Allen Hastings has created a gem of a 3-D rendering program that is easy, logical, and a pleasure with excellent output, a wealth of features and fascinating texture control. LightWave 3D is not like a high-end system, it is a high-end system.

LIGHTWAVE MODELER

From LightWave 3D's main screen, you can enter the LightWave Modeler. It is here where you create all your 3-D objects. The traditional tri-view is the basis which allows viewing your object in 3 different windows, from the top, bottom, and side. A fourth window on the same screen shows your object in a static or "moving" wireframe preview. Every time you make a change to your object, you see it instantly in your rotating (about 45 degrees in ping-pong method) preview. A solid representation of your object is also available at the click of a mouse. All four windows can easily be resized with the mouse.

The menu bar on the top row of the interface holds a row of commands which, when selected, appear on the left side of your work screen. Objects are made up of points which form polygons. Your choice of primitive objects is pretty limited as far as modeler programs go. You can choose from a ball, box, disc, or cone. You can change the size or your object, rotate it, or stretch it. Extrude is used for giving ob-

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jects (like 3-D text) depth. Lathe will take an outline of an object and spin it around a selectable axis to form objects such as vases. Mirror creates a duplicate around a chosen axis. Clone is used with the Paste command for creating several copies of your object.

Polygons (the building blocks of all objects) can be created by clicking to create points and then "hooked" together by the Make button. Flip, Attach, and Detach are additional polygon tools. Surface will let you name individual surfaces. For example you would need to name the metal, wood, and eraser parts of a pencil object separately so you could assign separate object attributes when you enter LightWave 3D. Display control lets you move In, Out, Magnify, Pan, Fit (adjusts Grid size), and View, which changes the direction from which your windows are

seeing your objects. When extruding or lathing, you can toggle between creating objects with triangles or rectangles. Edit Object functions including being able to cut, copy, and paste objects. A handy Undo button is also available. All objects can be edited in layers (up to 8 at once) for added flexibility and a wealth of keyboard shortcuts are included.

There's not too much to say about LightWave Modeler. It's pretty similar to most 3-D modelers and doesn't break any new ground. One drawback is object creation. First you must click to create points, then you must select which points you want, then you have to hit Make to connect them. This three-step process should only be one, even Sculpt 4D lets you "draw" objects in real time. There is no direct text support with alignment via the keyboard; however, a 3-D font is included

as objects. IFF tracing would have been a welcome addition.

On the plus side the program is fast and accurate. The wireframe moving preview is fascinating to watch and is incredibly valuable. After you load a primitive, you are allowed to adjust (with the mouse) the size before you add it to your view. That's a nice touch, however, LightWave Modeler is just a very good no-nonsense program. Work needs to be done to make it easier and more user-friendly. For 3-D pros it's excellent, but IFF/brush tracing, real-time drawing, more primitives, and text entry are needed to turn it on to the masses.

TOASTER CHARACTER GENERATOR

The last leg on our Video Toaster journey takes us to the Toaster's built-in Character Generator (CG) for putting text,

NTSC Versus 24-bit by Arthur King

There has always been a great deal of confusion about the differences between NTSC composite video and RGB color. The increasing number of programs outputting 24-bit color files has increased almost daily. The number of devices that are capable of displaying 24-bit files has increased as well. The confusion occurs when we start discussing the use of NTSC signals to display images designed in 24-bit color.

24-bit RGB

Simply, 24-bit color is 3 separate images—one image for the RED, one image for the GREEN, and one image for the BLUE. Each of these images is monochromatic and may have values ranging from black to white. At this point they are no different from a standard AMIGA picture file. The difference is that a hi-res Amiga file may only have 16 distinct levels of gray between black and white, whereas the 24-bit file has 256. The 24-bit file gets its name from the fact that each color has 8 bits of information (2^8 to the eighth power = 256), hence 8 bits for the RED + 8 bits for the Green + 8 bits for the BLUE = 24 bits of image information. That calculates to a possible 16,777,216 colors available to the artist (2^24 to the 24th power). This a great deal of selection and overkill in the minds of many.

Why have such a selection? It exceeds virtually any need you may have whether for computer art, desktop publishing, film or TV. The human eye can't discriminate between many of those colors. 32-bit color systems have only 24 bits of color data and 8 bits of extra information describing things other than the color. 32-bit systems have an identical number of colors in their palette. Of course this is under ideal conditions. The file may have 24 bits of information, but the display monitor may not be capable of clearly showing all the colors in the palette. And this is an RGB monitor where the RGB signals from the display output device directly drive the three electron guns in the CRT. In other words, a best case scenario. Don't forget that in Amiga hi-res there are 736 pixels per video

line (in overscan) and 480 lines, meaning we have only 353,280 pixels on a monitor screen at a time. Please don't say, "16 millions colors on-screen at a time," because it's not possible. The correct phrase is "every pixel can be one of 16.7 million colors as desired."

NTSC Video

Most 24-bit images don't stay on RGB systems though. Most get transferred to video, better known as NTSC. The NTSC system is based on using three signals for the TV image—a red, a blue, and a green signal. To combine them into only one signal is not easy and several compromises are made in the process. The files are not added together in equal parts but in varying percentages. The outcome of this encoding process is that although an RGB signal can have a bandwidth of 30 MHz, your typical NTSC signal will not exceed 8-10 MHz (the FCC won't let you broadcast more than 4.2 MHz). Other encoding compromises force distinct hue changes to occur no more often as 80 times per horizontal line. To see this, fire up DeluxePaint in hi-res and draw a vertical red line. Immediately next to it draw a blue line. Your RGB monitor will have a hard time showing each line distinctly, but you'll probably make them out. Now look at the Amiga on an NTSC monitor or TV. The line will be one purple line with no hint of the two distinct colors there.

So we can see that our 24-bit image, once encoded to NTSC, has lost much of its luster. A great deal of our detail on color information is gone. However, NTSC provides an excellent image anyway. Broadcast television is founded on the idea of showing more than the eye can perceive, but not much more. That keeps the signal "small" in terms of bandwidth, making life easier for everyone involved. The NTSC signal cannot be described in the same terms as computer image files, but NTSC is considered (there are varying opinions on this) to have the capability to discriminate between

scrolls, and crawls over your video. You can also create frames for the Switcher or for use in ToasterPaint. The CG pages are stored in Books which contain exactly 100 pages and up to 20 different fonts at once.

The mouse is completely bypassed and all commands are executed via the keyboard (mainly the function keys). The first option is to choose the page type: Blank Page, Key Page, Frame Store Page, Scroll Page, or Crawl Page. A large number of fonts are included in various sizes as well as several colored fonts called ChromaFonts. There is also an included utility to create ToasterFonts from almost any Amiga font. Converted fonts must be only one color since there is currently no support to incorporate ColorFonts. Text color and Shadow color are selectable. Shadow types include Shadow Distance, Drop, Cast, Transparent Drop, and Trans-

parent Cast. Text/Pages are easily Justified to the Center, Right, or Left. Kerning is done manually with the arrow keys. Automatic kerning is missing and really should be included. Text Borders can be Thin, Medium, and Thick. A Graphic Separator allows putting a line in between text. Jump to Page features numerical input to go to a certain page quickly.

Fonts can be loaded and stored in RAM. The amount easily accessible is dependent on your memory. Copy Page, Insert Line, Delete Line, Erase Page, and Erase Book make editing easy. The palette commands let you create smooth gradient backgrounds from a top and bottom color. Color control is done with RGB sliders via the keyboard arrows. It's kind of clumsy and takes a little getting used to. Most of your pages will be basic Key pages if they are not Blank.

Frame Store pages are created to be manipulated with the Switcher effects. Scroll pages are used for credits rolling up the screen and Crawl pages produce a crawling message (like a bulletin) horizontally at a specified point on the screen (usually the bottom). All text screens must be "rendered" to the framebuffer which takes about 10 seconds. Scrolls and Crawls appear instantly and require no rendering (but do not allow ChromaFonts). All types of text, scrolls, and crawls can be saved as a project and are instantly accessible from the main Switcher screen.

The use of function keys for commands and color editing with the arrow keys takes a little getting used to. There also absolutely needs to be a way the user can incorporate his/her small logos and graphics for title bars (some are included such as flags and credit cards).

approximately 4 million colors (on a good day with no wind). To talk of 16 million colors and NTSC signals in the same breath is to discuss apples and oranges. Broadcasters indeed DO use devices that create 24-bit imagery, but do so knowing and accepting what happens to that signal after encoding. Video encoders cost between \$100 and \$8000, the only difference being how well they preserve the original signals. Now with that background, let me introduce a new concept.

Digital Video

Many video devices now work with digital NTSC composite video. What is it? Is it anything like computer image files? No, nothing like them. In fact they are closer in concept to digitized computer sound files than anything else. The NTSC composite video signal is very similar to an audio signal. It is an electrical signal that varies in amplitude and frequency over time. The video signal is much higher in frequency. Just as we can sample an audio signal and digitize it, we can sample a video signal and digitize it. The result is a file that represents a series of samples of each horizontal line, enough to finally describe an entire video frame of 525 lines. To make sure we are sampling often enough to be able to accurately define the signal, we sample at 4 times the rate of the subcarrier frequency or 14.14 MHz (some video equipment may sample at even a higher rate for better accuracy). The samples themselves are 8 bits wide, making for 256 discrete levels of information. These rates and sizes were chosen because they produce an image that is indistinguishable from the original.

At this point we have a digitized video image and could even put this information on a computer disk, but we need to keep in mind that it is NOT an RGB file. There is NO discrete information about the separate RGB images that went into the initial creation of that NTSC signal. The number of bits in the file have nothing to do with the number of colors available in the image. What we DO have is a handy way of digitally

handling a video signal. Such digital signals are used in TBCs, Framestores, DVE devices and, in more sophisticated manners, digital VCRs.

Although this technology has been around for many years it hasn't trickled down to the consumer until very recently. The more obvious case is NewTek's Video Toaster. Checking the Toaster spec sheet illuminates the fact that it is sampling at 4 times subcarrier frequency (4fsc) and the samples are 8-bit, same as normal TV practice. Its resolution is 70 nanoseconds, 736 pixels (samples) per line—same as the Amiga in hi-res. Checking the Toaster's framegrab files show them to not be RGB files, but digitized NTSC data. Its paint and character generation programs may indeed be creating 24-bit data, but those files seem to be translated to digitized NTSC for final output. The 35 nanosecond font resolution mentioned in the Toaster brochure is actually an APPARENT resolution, the result of using antialiased 70 ns fonts, exactly the same as Broadcast Tifler or Pro Video Gold. The 16 million colors mentioned in the brochure are "requested" colors, but not necessarily the final output.

Digital video is used the world around by broadcasters with great satisfaction. Nothing at all to be embarrassed about. For this technology to be made accessible to the consumer is wonderful. In fact, the new DCTV unit from Digital Creations is also based on digitized NTSC video in a similar manner and will output full spectrum NTSC color. So when you read about 24-bit color, ask yourself, "What do they really mean?"

•AC•

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NEWTEK'S VIDEO TOASTER SPECIFICATIONS

Video Standard:	NTSC	Memory:	8 fields (expandable)
Inputs:	4 composite synchronous input BNC connectors. 1 Volt p-p coherent chroma. Software controllable 75 ohm termination or high impedance for loop-through on each input. Keyed clamping DC restore.	Frame Store:	Dual outputs independently routed to switcher. Stores 1,2,4 or 8 fields.
Program Video Output:	1 Volt p-p composite into 75 ohm	Capacity:	Up to 1000 frames (per frame store device, depending on available storage).
Preview Output:	1 Volt p-p composite into 75 ohm	Load Time:	From RAM: < 1/5 second From Hard Disk: < 3 seconds.
Reference Video:	Composite color or blackburst on video input #1.	Switcher:	7 inputs: External Video 1-4. Digital Channel 1. Digital Channel 2. Matte Generator. Independent software control of input channel at every pixel (70 ns). Independently selectable Preview output.
Sequence Trigger:	GPI trigger with optional cable.	Linear Keyer:	16 steps at 70 ns resolution. 256 steps at 280 ns resolution.
Insertion Delay:	400ns Video In to Program Out.	Luminance Key:	Dual keyer for dual threshold keying or two independent keys. Dual clip level control with 256 steps. Key input switchable to any input or digital still store.
Sync Generator:	Sync, burst, and blanking internally regenerated. Meets all FCC and RS-170a specifications.	Digital Effects:	Arbitrary geometric remapping at 60 fps.
Signal to Noise:	> 55 dB.	Host Computer:	Amiga 2000/2500 with 5 megabytes of RAM (1 megabyte chip RAM) and hard disk.
Sampling Rate:	14.31818 MHz.	Power Requirements:	All power supplied by the host computer.
Quantizing:	8 bits.		
Differential Phase:	< 3 degrees.		
Luminance Bandwidth:	+0/-3 dB to 5 MHz.		
Luminance Resolution:	> 400 lines		

The ChromaFonts are beautiful and even beat out the Rolls Royce of Amiga fonts, Kara Fonts, in the looks department (to be fair - Kara Fonts are only created in 8 colors..but what if there were Kara Fonts for the Toaster..oooh..now that's scary!). Scrolls and Crawls allow different speeds with stop commands and the result is pure heaven. They simply glide by at an incredibly smooth 60 frames per second. The Toaster Character Generator puts my cable studio CGs to shame.

REFLECTIONS

As stated in this review there are several areas where the Toaster software needs to be reworked. NewTek has worked hard on improving their other products through updates and I am certain the Video Toaster will be no exception. But on the

whole the included programs and Toaster Hardware perform very well. The only drawback that might turn some users off is the professional nature of a typical Toaster setup. It's an incredible asset to any production house but home users will need additional hardware to make the most of the video effects. Even if you own no video hardware the Toaster is worth it as a dedicated Paint/3-D Modeling system. It's that good. Also the Toaster needs to be less close-ended. Options for genlock compatibility is a must. What made the Amiga the machine it is today was its interchangeability of files, features, and hardware between various programs. The coming year will see if the Toaster will adapt. It will either blossom...or ferment.

Perhaps the most perfect feature is the output...and in the end that's where it

counts. The crisp fonts, the dazzling paint effects, the incredible 3-D images, and those nifty digital effects.

Looking at our waveform/vectorscopes at the studio shows a bright, clean video signal of professional standards. Although the Video Toaster has had a lot of problems with long delays, the end result is without question worth the years of wait. A round of applause to NewTek, they have created a new Amiga era. The Video Toaster has arrived and Amiga video will never be the same.

•AC•

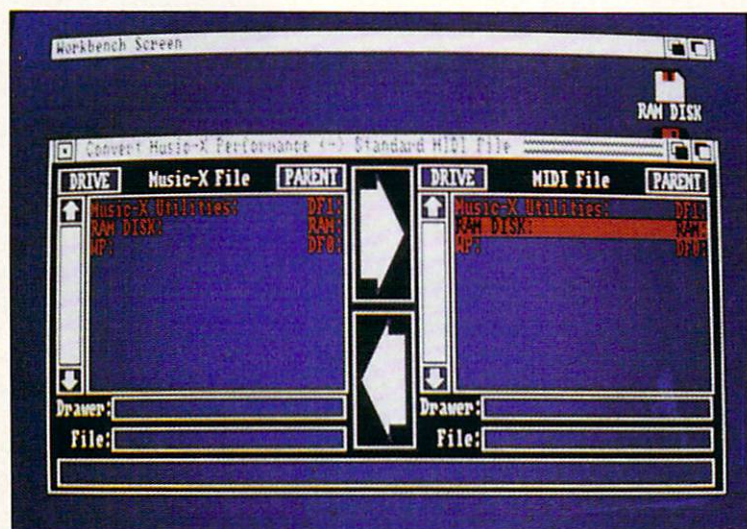
The Video Toaster
Price: \$1595.00
NewTek
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Inquiry #229

Medley



by Phil Saunders

One of the best ways to get started in MIDI sequencing is by modifying sequences recorded by others. It is easy and instructive to change the key, tempo, and instrumentation of a song to find out how its arrangement "works". Modifying prerecorded sequences can also teach you a great deal about how your sequencer works. Since most Amiga sequencers read and write standard MIDI files, you have access to a whole library of prerecorded sequences. This month's column will discuss standard MIDI files, how to load them into your sequencer, and how to modify them to suit your needs and equipment.



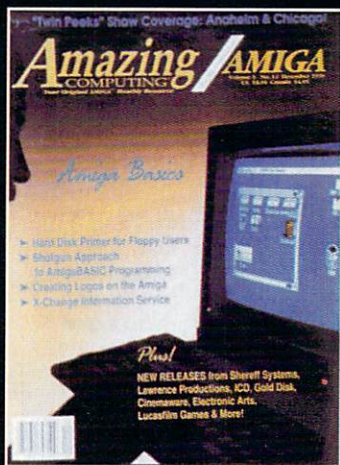
Microillusions' Music-X uses a stand-alone program to convert standard MIDI files.

A standard MIDI file is a MIDI sequence which can be loaded into any sequencer that reads the standard MIDI file format. The format was defined by the MIDI Manufacturer's Association in 1988 to allow sequences to be transferred from one sequencer to another. Before the advent of the standard, the only way to move files between sequencers was to connect the sequencers via MIDI and have one sequencer record the output of the other. In addition to causing timing delays, this method was inconvenient because it required both sequencers to be physically located in the same place. Standard MIDI files, on the other hand, can be downloaded via modem or saved to disk and then moved to another computer. While there are actually three different formats for MIDI files, most standard MIDI files are in Format 1, which uses a separate track for each instrument. Format 0 MIDI files pack all the instruments into a single track, while Format 2 files incorporate advanced features and are rarely implemented by sequencers.



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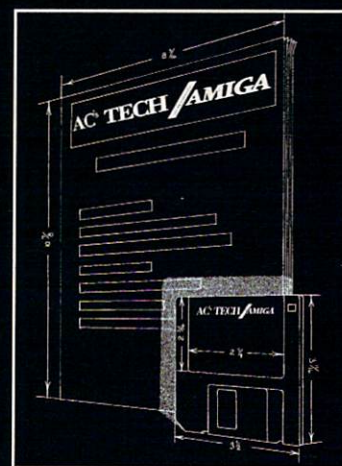
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Many computer bulletin boards have a MIDI section with a library of standard MIDI files available for downloading. Commercial information services like CompuServe, PAN, and GENIE each have MIDI forums with a large selection of files. In addition, a number of companies sell MIDI arrangements of popular songs and classical pieces in standard MIDI file format. These are often more detailed than public domain versions, including complete drum parts and full orchestrations. Check the classified ads in *Keyboard* and *Electronic Musician* magazines for more information on vendors of standard MIDI file sequencers. Not all of these companies offer their sequences on Amiga disks, but it is easy to use, for instance, Consultron's CrossDOS to read IBM and Atari ST disks on the Amiga.

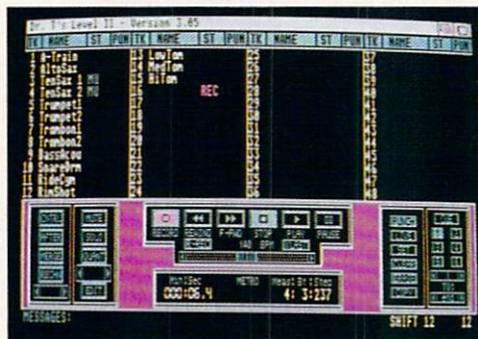
Standard MIDI files must usually be converted to the sequencer's native format before they can be used. Some sequencers (like KCS from Dr. T's Music Software) perform this conversion automatically upon loading the file, while others (like Microillusions' Music-X) use a stand-alone conversion program. The conversion process may require some user intervention. Sequencers vary in their timing resolution, which is measured in steps per beat. If the sequence being imported uses a different resolution than the sequencer, it may be necessary to adjust the resolution of either the sequencer or the imported sequence. I generally adjust the sequence to KCS's standard 240-steps-per-beat because I find it easier to always work with even numbers when editing sequences. This adjustment can introduce some minor timing problems so, if timing is critical, you may prefer to adjust the sequencer's default resolution to match the imported sequence.

Standard MIDI files imported into KCS are always converted into tracks. In KCS's Track Mode, the length of Track 1 determines the overall length of the song. With some standard MIDI files, Track 1 isn't set to any particular length, so the file initially produces no sound. This problem can be remedied by finding the length of the song and then entering rests ("deleted events" in KCS lingo) in Track 1 until its length matches the length of the song. The sequence should then loop properly.

Once you have a standard MIDI file loaded into your sequencer, you can begin the process of modifying it to suit your equipment. This generally involves assigning patches on your synthesizers to match each track of the file. The title of each track usually specifies the type of instrument which should play the part (such as bass or keyboard). Note which MIDI channel the track plays on and assign an appropriate instrument to that channel. You should try to get close to the sound used on the original recording initially, but feel free to experiment with other

sounds. It may be necessary to transpose particular tracks up or down an octave so that they will play in the correct range with a particular synthesizer patch. You can also assign the Amiga's sound samples to play a particular part. This is a good way to expand your sonic pallet, even if the resulting sound quality is limited. (Of course, if you don't have a synthesizer, you will have to rely on the Amiga's four voices to play all the parts.)

Drum tracks usually cause the most problems. The layout of the MIDI drum sounds is not standard, so a C2 may play a bass drum on one drum machine and a crash cymbal on another. Drum parts may either have separate tracks for each drum sound, or combine all the drum parts into one track. In either case, each note is assigned to a specific drum sound.



Dr. T's KCS: The saxophone tracks are muted and the ride cymbal is delayed.



KCS Level II's Pitchmap screen can remap drums.

The trick is to determine how the drum sounds, in the standard MIDI file, match the drum sounds on your drum machine or synthesizer. Once you know that a C2 on the MIDI file should be a D2 in order to play a snare drum sound on your synthesizer, you can begin to edit the drum tracks. If each drum is on a separate sequencer track, you can simply transpose each track until the drum plays the proper sound on your equipment. If the drums are all on one track, you may need to split the drum track into separate tracks for each drum and then transpose the individual tracks.

KCS Level II has a pitch map feature ideal for transposing from one set of drum note assignments to another. Remember, if you have set a drum channel KCS will not transpose notes assigned to that MIDI channel! You will have to go to the "Environments" screen to turn off the drum channel before you can transpose the drum tracks.

Once you have all the parts playing the correct sounds, begin to experiment with the playback of your song. Alter the tempo to see how the feel of the music changes. Try muting some tracks so you can isolate the contribution each instrument makes to the arrangement. If your sequencer can display notes as it plays them, look at the graphic representation of the song. Notice how the melody "looks" as it is played. If your sequencer can "time adjust" tracks, try pushing the drums forward so that they anticipate the beat slightly. Then try delaying them so they lag behind the beat. Experiment with assigning different sounds to each of the tracks. Changing the instrument that plays a particular part can make a drastic difference in the feel of a song. Be creative! You should also try recording your own parts to augment or replace ones in the sequence. If your keyboard skills aren't great, slow the tempo when you record

Products Mentioned

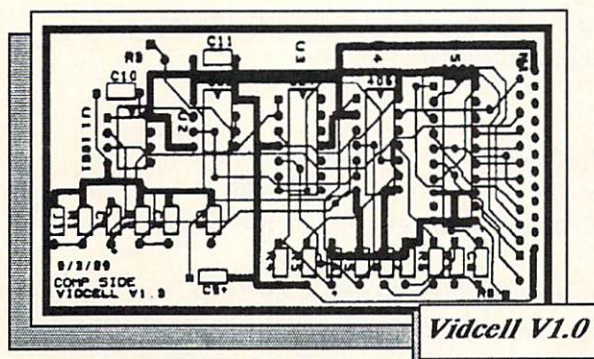
Music-X: \$299.95
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Granada Hills, CA 91394
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KCS: \$249.00
KCS Level II: \$349.00
Dr. T's Music Software, Inc.
220 Boylston St. #306
Boston, MA 02167
(617) 244-6954
Inquiry #206

and then increase it for the playback. Keep trying until you get a good take.

One of the benefits of MIDI is that experiments which don't work can easily be fixed. If the song still has a "computer feel" it may have been overquantized or converted from music entered by hand, not played via MIDI. One symptom of a score entered by hand is that all the note velocities are assigned the same value. As a result the volume of a part remains constant throughout the song. This lack of dynamic variation is distinctly unnatural and is a leading cause of a "computer feel." We will cover ways to "rehumanize" sequenced music in a future column.

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Alert V3.6

Customize your alert boxes (or Gurus) with Alert. This program allows you to create messages up to seven lines in length, and then save the text—along with an executable file—to construct a Guru message box.

Once your text is chosen, select the Test gadget to see your text set inside a Guru box. Use the Save gadget to save your Guru text, and the Load gadget to retrieve.

The Special menu contains several options including the Reset option, which resets the Amiga with a hard reset, and New Alert, which will delete the active Guru text. The ability to save the alert file to the bootblock of a disk is a planned feature for a future version of the program.

Alert V3.6 can be found on Fred Fish disk #417. It can be executed from the CLI or Workbench. This program is shareware. Author: Peter Händle

BootX V3.40

BootX is a virus killer that checks memory and bootblocks for any known viruses, as well as disks for link viruses. BootX has the ability to load "brain files", allowing you to add any bootblocks not yet recognized by BootX.

Once loaded, BootX presents you with the Main screen. Here you have gadgets which allow you to perform different tasks with bootblocks. BootX retains a buffer that contains the last read bootblock. You can write this bootblock to a specific drive, or display it in a semi-ASCII form (only readable characters are displayed). You can also save the bootblock to any valid device.

Besides the many bootblock-related options, BootX also features a Goto Sleep option, which allows you to close BootX's Main screen, free up memory and still keep BootX readily available. When BootX is put to sleep, its Main screen closes and a small window is created on the Workbench. In this state, BootX will not perform any virus checking; rather, you must activate it again.

by Aimée B. Abren

Other options include Kill Link Virus and Load Brain File. The former will check a selected device for link viruses. The entire disk is checked. Future versions will allow for specific directory and file checking. The Load Brain File option allows you to load an alternative brain file in memory besides the default, BootX.Brain. There is also a Learn option that lets BootX "learn" the bootblock currently in the buffer. BootX will then add this to the current brain file if it is not already there.

The documentation included with BootX is small, but each option is described clearly.

BootX V3.40 can be found on Fred Fish disk #420. This program can be started from the CLI or Workbench. Author: Peter Stuer

IFF2SOURCE V1.0

IFF2Source will convert IFF ILBM or ANIM files to C or assembly code. This code can then be used in your own programs.

When loaded, IFF2Source displays a window with numerous gadgets. Select the picture files you want converted (you can select more than one) and they will appear in a list on-screen. Once a conversion is complete, the file will disappear from the list.

If there is a file or files in the list that you want to exclude from the conversion process, double click on the file name. This will place an asterisk ("*") in front of the name, flagging IFF2Source to not convert the file to code. The asterisk is a toggle switch; simply double click again to remove it.

Select files for your list with the Add gadget. Wild cards are supported for a faster selection. You can use #? to select all files in a directory; however, .info will not be added. Once the files are selected, set your destination directory to the directory to which you want the code saved. The default is the current directory. Now you are ready to hit the Start button.

Other options include Abort, which stops the current action, and Unmark, which "unmarks" all files highlighted with an asterisk so they may be included in the selected list.

There is also an Info option that will allow you to see a small version of the IFF file. You can only see two bitplanes, but you can choose which two. Press "Stop" to exist the Info option, or "Okay" to see the next file. The Info option is for included files only (files without an asterisk).

IFF2Source V1.0 can be found on Fred Fish disk #420. It can be run from the Workbench or CLI. AmigaDOS 2.0 is required to run the program. Author: Jorrit Tyberghein

MenuWriter V3.1

MenuWriter is a program that allows you to write a menu to the bootblock of a disk. Once created, you can execute commands or batch files and run programs by selecting the appropriate menu selection. You can have up to 30 menu items (40 if you are a PAL user) on your menu.

Run MenuWriter to display the screen for creating menus. You will see two columns of 30 boxes each (40 if you are a PAL user). On the left side, you enter your menu selection exactly as you want it to appear on your menu. The right side is where you enter the name of the command, batch file or program you want executed when the corresponding menu selection (on the left) is selected. Above the two columns of boxes are two more boxes for the title and subtitle of your menu.

Also included with MenuWriter are two menus, Project and Edit. The Project menu contains the self-explanatory options About, New, Load, Save and Quit. You cannot, however, load a file that has not previously been created with MenuWriter.

In the Edit menu you will find "Write menu to dfx", which creates a file and writes the file to a newly formatted disk's bootblock (use of a newly formatted disk is stressed in the documentation). The Preview option, also found in this menu, shows how the menu will look.

Future enhancements being considered include a custom password and the ability to choose menu colors. An extra feature already included is a virus detector that checks key vectors known to be affected by viruses.

MenuWriter V3.1 can be found on Fred Fish disk #420. It can be run from the Workbench or CLI, and requires the Arp library. Author: Peter Stuer

Lila V9004b

Lila is a utility that makes it possible to print text files on PostScript printers. Some features include the ability to choose between Portrait and Landscape, and whether you want normal or condensed text.

At the program's onset, three gadgets appear requesting the Input file, Title, and Output file. Here you select the file to be printed. The Title gadget lets you pick the title you want to appear at the bottom of the page. The default is the name of the document selected to be printed. Number of columns and number of characters per line are two other included options.

You can change any defaults by selecting Tool Types under the Info

from the Workbench menu. For a complete list of valid Tool Type options, refer to the included documentation.

Lila V9004b, an update to V8912.a on Fred Fish disk #368, can be found on Fred Fish #414. The Courier font and Kickstart 1.2 are needed. The Arp library is suggested, but not required. This program is shareware. Author: Bertrand Gros

WhatIs V2.0

WhatIs is a utility that recognizes many different types of files including executables, IFFs, objects, archived files (like ZOO, ARC, and Arcfiles), and .info files. When the file is recognized, WhatIs will display file information such as file type, size, date of last change and more.

This update includes a new PAGE option, as well as the ability to start the program from the Workbench.

WhatIs will display info for a file, device or directory. You can select the

amount of information (Short, Medium or Full) displayed for a device or directory.

If you choose to run WhatIs from the Workbench, you will need to go to Tool Types to change any default settings. Because you will probably want to change settings often, the author, in the documentation, suggests an alternative approach when running the program from the Workbench.

For a complete list of all recognized files, as well as all supported Tool Types, check the included documentation. At the end of the file you will find examples of how WhatIs can be used.

WhatIs V2.0, an update to V1.2a on Fred Fish disk #334, can be found on Fred Fish disk #417. This program is shareware and requires AmigaDOS 2.0. Author: Jorrit Tyberghein

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ULTRASONIC RANGING SYSTEM

by John Iovine

This is part two of a three-part hardware project series that began with the article "Stepper Motors" in AC V5.12, December 1990.

Our ultimate goal in this series is to building a functioning Amiga sonar system. This time, we tackle the task of assembling an ultrasonic ranging system. The circuit herein uses inaudible ultrasonic pulses to detect objects and measure distances.

The velocity of sound, through the air, is about 1100 feet per second. The exact speed of sound actually varies slightly with the temperature of the air. As a rule of thumb, velocity changes by 1 foot per second per degree Fahrenheit. Thus, at 32°F (0°C) sound travels at a velocity of approximately 1100 feet per second. At 70°F, the speed of sound is closer to 1140 feet per second.

The frequency of a sound has no effect on its velocity. So, two sounds with different frequencies will travel at the same speed through the same media. Media, the material through which a sound travels, does effect the speed. For instance, sound travels at 4000 feet per second through water.

Original Design

When I first designed this circuit, I used two piezo-electric transducers. One transducer was connected to a pulse generator, to transmit an ultrasonic pulse. The sound traveled from this transducer to a solid object and then reflected back. The other transducer was con-

nected to a receiver circuit to detect the reflected echo. The elapsed time between the transmitted pulse and receiving the reflected echo is a function of the distance. Both receiver and transmitter circuits were connected to an oscilloscope. The stand-alone circuit worked quite well; I was able to accurately measure distance. One thing I had overlooked on the oscilloscope trace was "ringing" caused by the transmitted pulse in the receiver transducer. Although I was able to overlook this noise in the circuit and visually observe the return echo and make accurate distance measurements, the circuit was less than effective when interfaced to the computer.

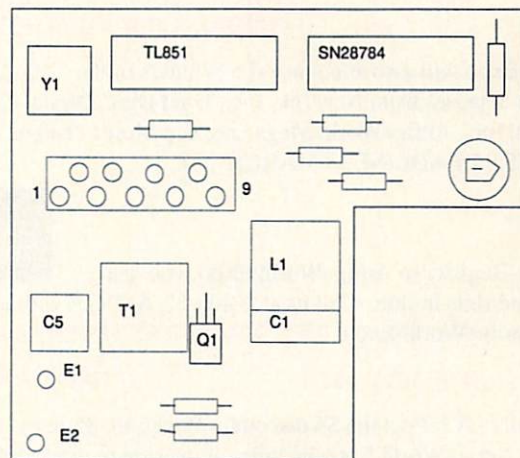


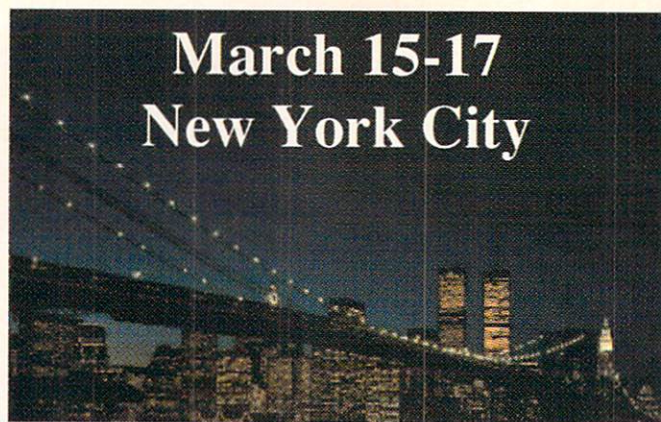
Figure One: Component Layout—
Polaroid Sonar Ranging Module

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SUNDAY	1:30 - 3:00	AMIGA MUSIC/VIDEO SEMINAR	3:30 - 5:00	NEXT GENERATION AMIGA GRAPHICS

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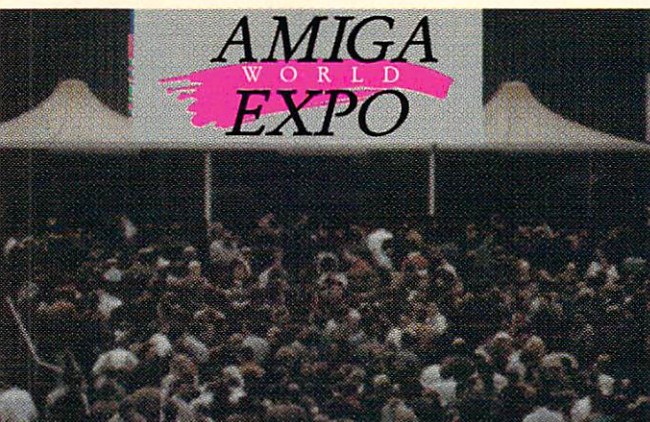
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"These two components, interfaced to the Amiga, are all that is required to measure distances from 1.33 to 35 feet."

This problem led me to scrap the original circuit and turn instead to a Polaroid Sonar Ranging Module, the PID #615077. This module is designed to drive a 50 kHz 400-volt piezo-electric Polaroid transducer. You may have seen this type of transducer on a number of Polaroid cameras (the module and transducer are available from Images Company; see parts list). These two components, interfaced to the Amiga, are all that is required to measure distances from 1.33 to 35 feet. The accuracy of the unit is $\pm 2\%$.

Polaroid Sonar Ranging Module

The module comes completely assembled, which leaves us with the tasks of supplying power and making two connections to the parallel port, and implementing the driving software. The module itself basically functions in the same manner as my original circuit, described earlier.

We will use a 5-volt power supply for the module, which can operate over a power supply voltage range from 4.5 volts to 6.8 volts. After power is applied to the

module, a minimum waiting time of 5 milliseconds is required, during which the module resets all its internal circuitry and stabilizes the internal oscillator.

To initiate after power up, the module's INIT input line is raised from ground to logic one. The module then transmits 16 pulses at 49.4 kHz with 400-volt amplitude to the transducer. At the end of the 16 cycles, a DC bias of 200 volts is left on the transducer, as recommended by Polaroid for optimum operation of the transducer.

In order to prevent "ringing" in the transducer from being picked up as a return echo, the Polaroid module inhibits the detection of any signal for 2.38 milliseconds. This internal blanking limits the minimum detection range to 1.33 feet. This

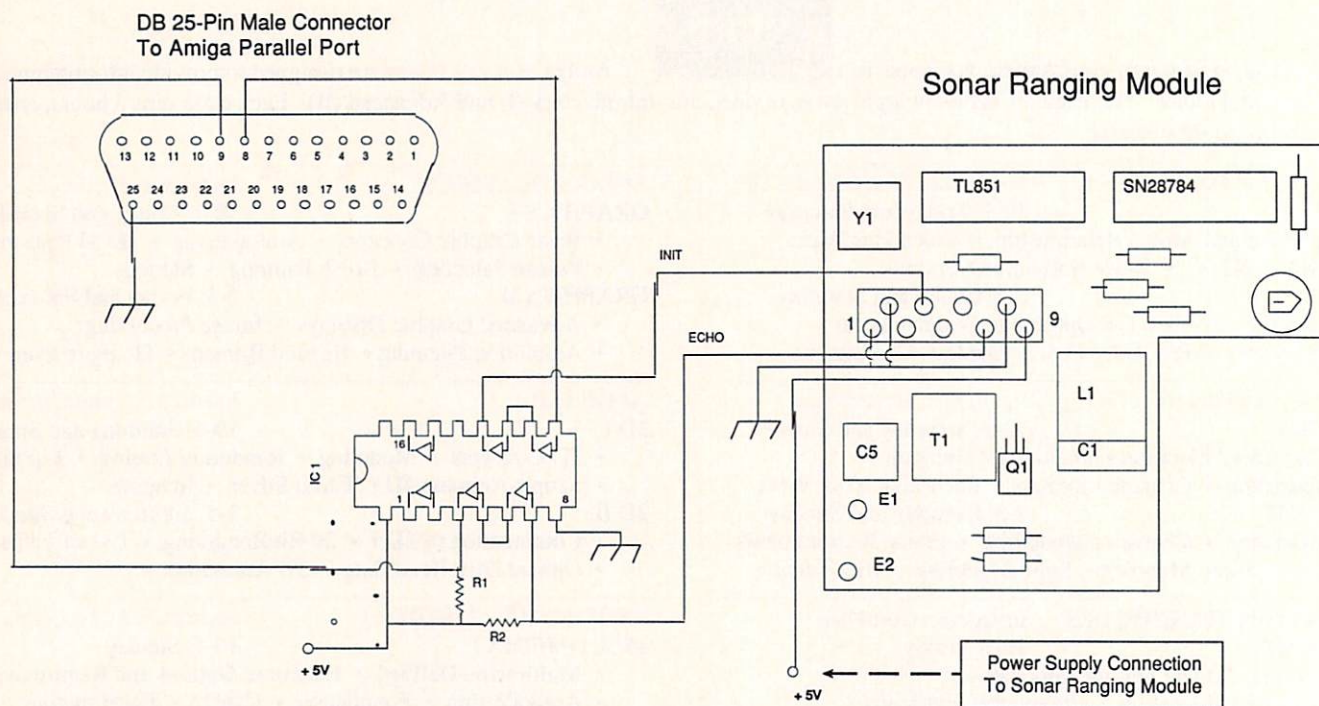
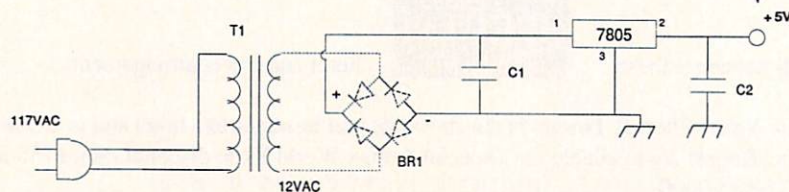


Figure Two



Power Supply For
Polaroid Sonar Ranging Module

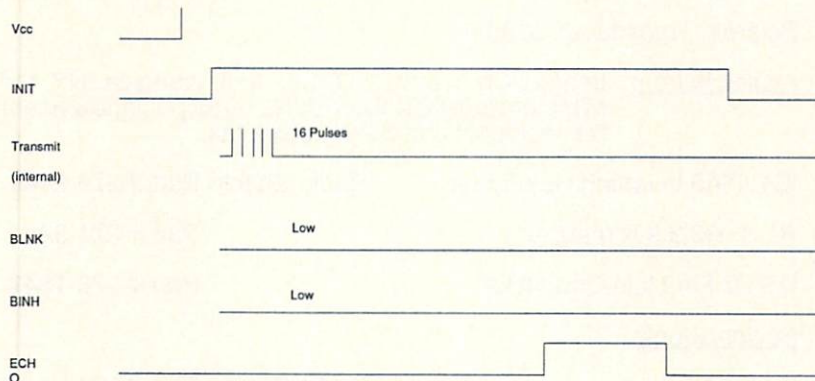


Figure Three: Single-Echo Mode

feature can be overridden by bringing the BINH (Blanking Inhibit) line high any time prior to the internal blanking to detect objects closer than 1.33 feet. We will not do this; the BINH line is held to ground (0 volts).

The Polaroid Sonar Ranging Module has two basic modes of operation: single echo and multiple echo. The single-echo mode is the one we will use this time out. In this mode, the module assumes a single target, essentially listening for the first return echo only. When the module detects the return pulse, it brings the ECHO line high. The elapsed time from when the INIT line is brought high to when the ECHO output line goes high is proportional to the distance of the object to the transducer.

As previously stated, sound travels at approximately 1140 feet per second at room temperature. This works out to about 1.368 inches every .1 millisecond. In addition, remember that the sound has to travel from the transducer to the object and back to the transducer. So, the actual distance is equal to half the total time elapsed.

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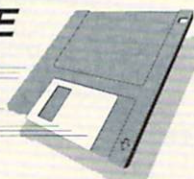
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In multiple-echo mode, we can direct the module to continue to listen for additional return echos after the first one. This can be accomplished by bringing the BLNK (Blanking) line high for .44 milliseconds after the ECHO line goes high. This resets the ECHO line so the module can detect additional objects farther away. The specification sheet on the Polaroid module we are using here states that the module can detect target objects that are only 3 inches apart. We will not be using this mode; the BLNK line will be held to ground.

Dynamic Amplification

One nice feature of the Polaroid module is dynamic amplification. If you think about it, a returned echo pulse from a close object will be much stronger than a return pulse from a distant object. The Polaroid module compensates for this automatically. The longer the module waits for a return pulse, the greater it automatically increases the amplification in the receiver section.

PARTS LIST

Polaroid Sonar Ranging Module: \$55.00

Polaroid Transducer: \$20.00

Available from: Images Company, P.O. Box 313, Jamaica, NY 11419.
Minimum order \$10.00. Add \$2.50 for postage & handling.
NY residents add 8.25% sales tax.

IC1 4049 Inverting Hex Buffer Radio Shack Part # 276-2449

R1 & R2 3.9 K resistor " Part # 271-029

DB 25-Pin Male Connector " Part # 276-1547

Power Supply

Bridge Rectifier Radio Shack Part # 276-1146

Transformer 120/12V " Part # 273-1352

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Interfacing The Hardware

Figure One is a component layout of the Polaroid module. The module may be supplied with a ribbon cable connected to the output lines. If this is the case, simply strip the wires and connect them to the power supply and the Amiga's parallel port. If the board comes with just a connector, desolder and remove the connector, then solder lead wires in holes 1, 2, 4, 7, 8 and 9. Lines E1 and E2 have leads soldered to them already with a clip to connect to the transducer. These lines correspond to the following:

Line 1: Ground

Line 2: BLNK (Blanking)

Line 4: INIT (Initiate)

Line 7: ECHO

Line 8: BINH (Blank Inhibit)

Line 9: + 5 volts

Line E1: + Lead to Transducer

Line E2 - Lead to Transducer

Figure Two is the general schematic. I placed a 4049 buffer between the parallel port and the module. I used two buffers per line, so the signals are inverted twice, giving us back the original input (buffered, of course). By tracing the lines through the buffer, you will find the INIT line connected to pin 8 on the Amiga's parallel port, and ECHO is connected to pin 9. Lines 1, 2 and 8 are held to ground. Line 9 is connected to the power supply. Don't forget to connect the grounds from the Amiga parallel and power supply to the main circuit.

Figure Three shows the timing scheme for single-echo mode.

Polaroid Transducer

The ultrasonic transducer manufactured by Polaroid contains a unique material, a piezo-electric plastic film manufactured by Pennwalt Corporation. This piezo-electric plastic material has a conductive metal coating vacuum deposited on both sides. This coating provides good electrical contact with the surface of the material and gives the plastic sheet the appearance of tin foil.

The transducer is supplied with two clips used to attach wires. Solder wires to the clips before putting them on the transducer. The positive lead should be connected to the tab that is connected to the spring clip on the back. The negative (ground) clip should be connected to the small tab on the case.

Driving Software

The elapsed time between the transmitted pulse and receiving pulse can vary between 3 to 64 milliseconds. Obviously, BASIC is not fast enough to measure these short time intervals. It became necessary to write a ML subroutine that gets called from BASIC to drive the sonar ranging module (see listing at left). The ML subroutine measures time between pulses in .1 millisecond intervals. To insure accurate timing, a timer on the 8520 is used as a clock. In addition, interrupts are disabled when the ML routine is called and enabled before returning to BASIC. The BASIC program reads the elapsed time and performs the necessary calculations for distance, which is then displayed on the monitor. BASIC also pokes a zero in the software's time-elapse register to clear it for the next measurement.

I didn't take much time to write the BASIC portion of the program. Pressing any key when the program is running will stop the program, reallocate the memory, and close the open library. The distance measures are continually taken and printed onto the screen. Obviously, there is a lot of room for improvement if you want to add some BASIC graphics.

Next Time

In the final installment of this series, we'll use this project in conjunction with the Stepper Motor project that appeared in December 1990 to build a simple Amiga-based sonar system.

•AC•

BASIC Sonar Ranging Program

```
REM Sonar Ranging Program
REM J. Iovine
LIBRARY "exec.library"
DECLARE FUNCTION allocmem% LIBRARY
mlspace% = allocmem%(156,1)
FOR j% = 0 TO 78
  READ mlcode$
  POKEW mlspace% + j%*2, VAL("%h" + mlcode$)
NEXT
' ML Code
DATA 48e7, c080,2c78,0004,4eae,ff88,41fa,0086
DATA 10bc, 0000,13fc,007f,00bf,e301,13fc,0000
DATA 00bf, e101,0039,0040,00bf,e101,1039,00bf
DATA de00, 103c,00c0,803c,0008,13c0,00bf,de00
DATA 13fc, 007f,00bf,dd00,13fc,0048,00bf,d400
DATA 13fc, 0000,00bf,d500,0839,0007,00bf,e101
DATA 6620, 0839,0000,00bf,dd00,67ec,0650,0001
DATA 0c50, 0276,6700,000c,08f9,0000,00bf,de00
DATA 60d6, 0239,003f,00bf,e101,4eae,ff82,4cdf
DATA 0103, 4e75,0000,0000,0000,0000,0000,0000

' Start Basic Routine
start:
CALL mlspace%
totaldis = PEEKW (mlspace% + 148)
distance = totaldis/2
inc = distance * 1.368
REM add adjustment approx. 6 inches
adg = 6: inc = inc + adg
feet = INT(inc / 12): ft = feet * 12
inches = INT(inc-ft)
LOCATE 11,1 :PRINT "
LOCATE 11,1
PRINT "Distance is ";feet;" feet and ";inches;" inches."
POKEW mlspace% + 148,0
a$=INKEY$:IF a$="" THEN GOTO start

CALL freemem(mlspace%,156)
LIBRARY CLOSE
END
```


Writing Faster Assembly Language

by Martin F. Combs

Emphasis in my two previous articles (AC V5.10, October 1990 and AC V5.2, February 1990) has been on speeding up programs written in BASIC or Modula-2, by integrating machine language into them. I closed last time by noting that getting the iterative part of a program successfully translated into assembly language is not necessarily the last step in speeding up that program. If this translation is successful, the program will certainly run faster than before. Its speed may yet be substantially increased further—perhaps even doubled—through the crafting of an optimum set of assembly language instructions to do just that.

*What you need
is a program
that times
individual
instructions ...
and does so with
the expenditure
of only a couple
of minutes of
your time.*

Any but the most trivial of assembly language programs can be written in many different ways. Every programmer evolves his own style, accumulating a bag of tricks which are comfortable to him, though they may not represent the fastest or most memory-efficient way to get a specific job done. One of the most challenging truths about assembly language is that no matter how good a program is, it can almost surely be improved. A frequently quoted rule states that if a program can be rewritten with fewer steps, requiring less memory, then it should also be a faster program than before. This rule turns out to be true more often than not, but it is far from true enough to depend on. There are many exceptions, several of which will be discussed later on in this article.

Assuming you have a program that runs *properly*, the next step is to think of other ways to write it to make it run *faster*. When you think of a possible improvement, try it out and time it. To do this you have to edit, reassemble and link the whole program, and if it is to be integrated into a higher-level language you have to take all the necessary steps to do that also.

But wait—there has to be an easier way! What you need is a program that times individual instructions, or perhaps small groups of instructions, and does so with the expenditure of only a couple of minutes of your time. The idea here is to put the instruction into a loop, run it through a few million iterations, and time it. Since each new instruction to be timed requires reassembly and relinking of the program, the extra effort of incorporating it

into a higher-level language each time is not practical. The total time involved in editing by replacing one line, assembling, linking and running the program provided here is about 90 seconds.

For the benefit of newcomers to the field of assembly language programming, I'll discuss the program at some length, since the handling of libraries and various routines from those libraries is typical of most stand-alone assembly language programs. Line numbers have been added for easy reference; they should be removed before assembly. The program must be both assembled and linked, but it needs no other files, such as "include" files. Here it is:

```

1  CloseLibrary equ    -414
2  CurrentTime  equ    -84
3  OpenLibrary  equ   -552
4  Output       equ    -60
5  Write        equ    -48
6      movem.l   d0-d7/a0-a6,-(sp)
7      movea.l   4,a6      ;exec base
8      lea       intuiname(pc),a1
9      moveq     #0,d0      ;accept any version
10     jsr       OpenLibrary(a6) ;open intuition library
11     move.l    d0,intuibase
12     beq       nointui    ;open not successful
13     lea       dosname(pc),a1
14     moveq     #0,d0      ;accept any version
15     jsr       OpenLibrary(a6) ;open dos library
16     move.l    d0,dosbase ;store address of library
17     beq       nodos      ;open not successful
18     movea.l   intuibase,a6
19     lea       startsecs(pc),a0
20     lea       startmusecs(pc),a1
21     jsr       CurrentTime(a6)
22     moveq     #41,d4      ;outer loop executes 42 times
23 outerloop move.l   #-1,d5 ;inner loop executes 65536 times
24 innerloop move.l   startsecs,d1 ;instruction to be timed
25     dbra      d5,innerloop
26     dbra      d4,outerloop
27     lea       endsecs(pc),a0
28     lea       endmusecs(pc),a1
29     jsr       CurrentTime(a6) ;get ending time
30     move.l    endsecs,d6
31     sub.l     startsecs,d6 ;d6 holds seconds
32     move.l    endmusecs,d7
33     sub.l     startmusecs,d7 ;d7 holds microseconds
34     bpl.s     around
35     subq.l    #1,d6 ;borrow one second
36     add.l     #1000000,d7 ;change to microseconds
37 around      lsr.l   #7,d7 ;divide by 2^14
38     lsr.l     #7,d7 ;to get cycles
39     mulu      #60,d6 ;convert seconds to cycles
40     add.l     d6,d7
41     sub.l     #277,d7 ;subtract loop overhead
42 bindec      lea     decbuff(pc),a0 ;decbuff holds number
43     move.b    #' ',d1 ;space for + sign
44     tst.w     d7
45     bpl.s     positive
46     move.b    #'-',d1 ;sign for negative
47     neg.w     d7
48 positive    move.b   d1,(a0)+ ;store sign
49     addq.l    #5,a0 ;point to end of decimal buffer
50     move.w    #4,d1 ;execute loop 5 times
51 decloop     ext.l   d7 ;clear upper word of time
52     divs     #10,d7 ;upper word holds remainder
53     swap     d7 ;remainder now in lower word
54     move.b    d7,-(a0) ;store digit in decbuff and
55               ;point a0 at next higher digit
56     add.b     #'0',(a0) ;add ascii 0 to get ascii
57     swap     d7 ;quotient now in d7 lower word

```

```

58     dbra     d1,decloop
59     movea.l   dosbase,a6 ;point to dos library
60     jsr       Output(a6) ;get file location for Write
61     move.l    d0,d1
62     beq.s     quit ;Output operation unsuccessful
63     moveq     #7,d3 ;will write 7 bytes,including CR
64     move.l    #decbuff,d2 ;point to buffer
65     jsr       Write(a6) ;Write decimal time
66 quit       movea.l   dosbase,a1
67     movea.l   4,a6
68     jsr       CloseLibrary(a6) ;close dos library
69     nodos     movea.l   intuibase,a1
70     jsr       CloseLibrary(a6) ;close intuition library
71     nointui   movem.l   (sp)+,d0-d7/a0-a6
72     rts
73     decbuff   ds.b     6 ;stores ascii of decimal time
74     carreturn dc.b     10,0 ;10 is carriage return
75     startsecs ds.l     1 ;starting time in seconds
76     endsecs   ds.l     1 ;ending ditto
77     startmusecs ds.l   1 ;starting time in microseconds
78     endmusecs ds.l     1 ;ending ditto
79     dosbase   ds.l     1 ;pointer to dos library
80     dosname    dc.b     'dos.library',0,0
81     intuibase ds.l     1 ;pointer to intuition library
82     intuiname dc.b     'intuition.library',0
83     nop
84     end

```

Lines 1-5 are names of library subroutines, with corresponding offsets which are applied to a pointer, register a6, to jump to the subroutines. Line 6 saves all registers. Line 7 moves the address in memory location 4 to a6. This is the base address of the exec library, which holds the OpenLibrary and CloseLibrary routines, and many others. The OpenLibrary function requires a pointer to the name of the library to be in a1 and the version number to be in d0. That version (or any later one) will be accepted; putting a 0 in d0 means that any version is fine. If all goes well, the OpenLibrary function returns in d0 a pointer to the base of the requested library; if not, it returns 0 in d0. A 0 in d0 indicates an attempt to open the intuition library has been unsuccessful, and line 12 causes a branch to the end of the program, where the registers are restored and control is returned to DOS.

Lines 13-17 do the same thing for the DOS library, but if the attempt to open the DOS library is not successful, the previously opened intuition library must be closed before exiting the program. Pointers to libraries must be in a6, and the intuition function CurrentTime gets used next; hence, line 18. The CurrentTime function requires a pointer to a storage location for seconds in a0 and a similar pointer for microseconds in a1. After line 21 we have the starting time stored properly. The dbra dn, label instruction, where dn is a loop counter, causes the loop starting at label to be executed one more time than the starting value in dn, so the outer loop gets executed 42 times and the inner loop, 65,536 times. Think of the -1 in d5 as a cardinal number rather than a signed number, i.e., -1 is really 65,535. The instruction to be timed is a move of a long integer from some memory location (startsecs happens to be a convenient location for purposes of illustration) to the register d1. Although you are repeating this instruction 2,752,512 times, it only takes a few seconds.

To actually use this program, replace line 24 with any single instruction, or set of instructions, you wish to time. Some take a little ingenuity; in fact, some are likely to summon a Guru if you attempt to repeat them a few million times. For instance, it is a bit difficult to time a bsr instruction by itself, but easy to time a combination of bsr and rts.

Lines 27-29 save the ending time. Lines 30-36 subtract the starting time from the ending time and put the seconds in d6 and the microseconds in d7. Note that the subtraction process includes a possible borrow of one second, i.e., 1 million microseconds, from d6. At first glance, the description of the CurrentTime function sounds great; it can be used to time an event in seconds and microseconds. However, a closer look at the documentation reveals the following quote: "This time value is not extremely accurate, nor is it of a very fine resolution. This time will be updated no more than sixty times a second, and will typically be updated far fewer times a second." Fortunately, the statement appears to be a bit pessimistic. Although the function can be used at best to *time* cycles—60 per second in the case of the United States and 50 per second in certain other countries—it does seem to be fairly reliable in *counting* cycles as well. At least, the results of this program are reasonably repeatable, rarely varying more than a couple of percent. This is more than accurate enough to decide which of two instructions to use in your program.

The numbers of repetitions of the loops have been chosen so that the result of timing the fastest instructions is about 100. This is done so that the differences in time of the various instructions can be readily compared; for instance, a reading of 350 means that the timed instruction takes about three-and-a-half times longer to execute than does the quickest instruction. For the specified number of repetitions the loop overhead is 277; that is, if no instruction was in the inner loop, it would still take 277 cycles for the program to execute. You should verify this for your machine by deleting line 24 and labeling line 25 innerloop. Lines 37-38 divide the microseconds by 2^{14} , and since 1,000,000 microseconds divided by 2^{14} is 61.035, this is close enough to the actual 60 cycles per second. After multiplying the seconds by 60 and adding the cycles contributed by the microsecond counter, the overhead is subtracted off.

The elapsed time in cycles in d7 is still in binary, so it must be converted into decimal and then into the ASCII equivalent of the decimal digits. Lines 51-58 get the job done. The Output function is part of the DOS library so a pointer to that library must be provided in a6. The Output function provides a file pointer in d1 to be used by the Write function, which is also in the DOS library. Write also needs a pointer in d2 to the text to be printed and in d3, the number of bytes to be printed. If that text does not contain a carriage return, 10, then the next CLI prompt will write over the output and it will be gone before you can read it. I know because I wasted a couple of hours trying to find out why I appeared to be getting no results. Finally, the libraries are closed out in the inverse order that they were opened, and the program returns to the CLI. Providing a capability for the program to function from the Workbench would only complicate the program further. I suspect that few assembly language programmers use the Workbench anyway.

There is an alternative to the CurrentTime function for determining the starting and ending times. It results in a shorter program because the intuition library doesn't have to be opened and it seems to provide a bit more repeatable accuracy. It has been

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checked out on the Amiga 500, A1000 and A2000, but is not guaranteed to work on all machines. Documentation for the Amiga seems to discourage the use of any absolute memory address except the address 4, but if it works, why not use it?

```
moveq    #7,d7      ; clear d7
move.b   $bfea01,d7 ; get high byte of time, in cycles
lsl.l    #8,d7
move.b   $bfe901,d7 ; get middle byte
lsl.l    #8,d7
move.b   $bfe801,d7 ; get lower byte
```

It might sound like a good idea to have a listing of the times of *all* possible instructions, but that turns out to be a bit impractical. There are over 100 different variations for the MOVE instruction alone. You will, however, want to build a table of the ones of most interest to you. A list of my timings is provided at the end of this article. Your results will vary somewhat from mine (particularly if your machine has additional memory), but the important thing is the relative difference in speed of various instructions, not the absolute speed. The latter is part of the nature of each machine. Of course, there is always a faster machine out there, but prepare to spend big bucks for it.

When timing instructions, it is a good idea to limit the amount of concurrent multitasking. Clearly, the results might not be accurate if you time one instruction on an otherwise unoccupied machine, and the next in a multitasking mode with 8 other programs running at the same time!

Subroutines are to be avoided!
Remember that the emphasis here is on speed, not on saving memory.

Assembling and linking of this program can be hastened somewhat through the use of a shell. The public domain assembler a68k and the public domain linker blink are both on Fred Fish Disk 110, as well as on various later releases. Assuming that your assembly language program is named timer.asm, the appropriate assembler call is "a68k timer.asm". If you want a file showing how the assembler converts your program to machine language, you must add a "-l" to the above. The assembler will give you a file called timer.o, or a list of errors, if there are any. When you get a timer.o file, the linker call is "blink timer.o". If all goes well, and it should, the linker will produce a file called timer. Then just enter "timer" to run it. Afterwards you should delete the timer.o file, since it serves no purpose.

Using a shell makes the process simpler. To go through all the steps outlined above, just enter "asb timer". The assembling, linking and deletion of the timer.o file then happen automatically. I use Matt Dillon's shell, and my login file includes alias asb "%q a68k \$q.asm; blink \$q.o; delete \$q.o". Other shells, such as the one supplied by Commodore in the 1.3 release, or the public domain ARP 1.3 shell, require somewhat different aliases or executable script files to get the same job done.

The wealth of addressing modes for the 68000 chip make writing assembly language a pleasure, but it's still a good idea to establish a few rules of thumb.

Subroutines are to be avoided! Remember that the emphasis here is on speed, not on saving memory. If saving memory was being emphasized, anything worth doing at least twice would probably be in a subroutine, but in striving for maximum speed, subroutines are expensive. The combined time score for a bsr and rts is about 865; that is, 8 moves between registers take place in less time than one use of a subroutine. If a subroutine is only a few lines long, just duplicate its code wherever you need it in the program.

Short branches should be set up (if possible) in such a way that the branch is not taken most of the time, since it takes a good bit longer to take the branch than not to take it. Specify short branches in your assembly language listing unless you are sure that the branch will be long. If the branch can't be short, the assembler will tell you about it. A good assembler such as a68k will change bcc to bcc.s for you when appropriate if the branch is backward, but it won't for forward branches since it doesn't know how far the branch will be. Strangely enough, both bcc.s and bcc.w take the same amount of time when the branch is taken, but when the branch is not taken, the bcc.w takes longer and the bcc.s takes quite a bit less time.

Operations done with registers take much less time than operations done in the immediate mode or operations done on data in memory. In highly iterative programs, most of the time is spent in a loop. Let's call it the inner loop since there may be nested loops. Do everything possible to maximize the use of registers in the inner loop, even if this means having a bit less than optimum code outside of the loop. If you need to use a compare instruction, use the cmp.l dn,dm form or something similar. Do the loading of the quantity to be compared into one of the registers before entering the inner loop. You could use cmpi.l #nnn,dn, but this takes more than twice as long. The same applies to the and instruction—used for masking—and to many others.

Pushing registers onto the stack and later recovering their contents is frequently necessary. When several registers need to be pushed, the movem instruction is more efficient than pushing them one at a time, provided that more than two registers are being pushed. For just two, it is faster to push them individually than to use the movem instruction.

Setting a data register to zero can be done in at least four ways. Moveq #0,dn or clr.l dn or eor.l dn,dn or sub.l dn,dn all get the job done, but moveq #0,d0 is fastest. There is no equivalent to moveq for the address registers; suba.l a0,a0 is the best you can do to zero an address register. Of course, if both data and address registers must be set to zero then moveq #0,dn followed by movea.l dn,an works fine.

The Motorola 68000 chip has built-in multiply and divide instructions, a great blessing to those of us who started out on the Z80 chip or something similar. These instructions are fast, but that doesn't mean that they should be used automatically. For multiplying or dividing by powers of two, the rotate instructions, the logical shift instructions and the arithmetic shift instructions all provide options for both left and right shifts. Some combination of these and the swap instruction may well prove faster than the multiply and divide instructions. Further, simple multiplications may be done in other ways. For instance, move.l d0,d1 followed by lsl.l #3,d0 followed by subq.l d1,d0 multiplies the contents of d0 by 7 and leaves the answer in d0. You could write it more simply as mulu #7,d0, but that would take about twice as long to run.

One of the most rewarding techniques for speeding up an assembly language program involving great masses of arithmetic is to convert it to integer, assuming of course that it is originally a program involving floating-point calculations. That way, you don't have to call all the floating-point routines, which are inherently slower than integer routines (as an example, see the article by Hugo M.H. Lyppens in AC V4.11, November 1989 on generating Mandelbrot fractals at lightning speed). Mandelbrot Sets, and their close relatives the Julia sets, have been a hot topic among recreational mathematics enthusiasts for the last five years or so, although the knowledge of the existence of these sets goes back much further. The Mandelbrot set-generation process involves floating-point calculations of numbers with absolute values that should never exceed four, which means that it is safe to scale the program up by a factor of 2^{28} and do all the arithmetic in longinteger mode without running the risk of exceeding the capacity of 32-bit registers. Four times 2^{28} is 2^{30} , which leaves a little space for overflow. I tried graphing the Mandelbrot Set with a scale factor of 2^{29} and got all sorts of interesting looking lines which unfortunately didn't belong there, but were just a result of overflow. In 1987 I wrote a similar program scaling up the Mandelbrot Set calculations by a factor of 2^{60} , the equivalent of doing the job with double-precision floating point. Once the technique is understood, the actual programming just takes a little care.

Scaling up seems a simple process. For instance, if you have a program involving money you might avoid floating point by scaling up by 100, in effect calculating in cents rather than dollars. A little formatting takes care of the decimal point in the output. As an example, suppose we want to scale everything up by a factor of ten. Then, to add 2 and 3 we actually add 20 and 30, get 50, and divide by 10 to get the answer—5. Similarly, if we want to multiply 2 by 3 we multiply 20 by 30 to get 600, divide by 10 and get our answer—60. Oops! Our answer should, of course, be 6. The bottom line is that when working in scaled-up arithmetic follow up all multiplications with division by the scale factor. Conversely, all divisions must be followed up with multiplication by the scale factor.

Multiplication or division by ten is easy in the decimal system: just move the decimal point. Similarly, the most appropriate number to scale by in a binary system is a power of two, since 2 is the base of the binary number system. Multiplying and dividing by powers of 2 is easy in assembly language. There are numerous instructions which can be used to shift the binary point, the base 2 equivalent of the decimal point.

Let's talk a bit about multiplying two 32-bit numbers. Since the 68000 multiply instructions operate on 16-bit words to get a 32-bit longword result, we can't just do a single multiplication. Assume a longint ab, where a is the upper word and b is the lower. Numerically ab is really $a*2^{16}+b$, just as ab is really $a*10+b$ in decimal notation. Similarly another longint cd would really be $c*2^{16}+d$. When they are multiplied together using the old binomial method of high school algebra, the result is $a*c*2^{32} + a*d*2^{16} + b*c*2^{16} + b*d$. Let's further assume that both ab and cd are being used in a scaled-up program, and both have already been scaled up by 2^{28} . Since multiplication must be followed by dividing by the scale factor, we must divide our result by 2^{28} . The final result is $a*c*2^4 + (ad+bc)*2^{(-12)} + b*d*2^{(-28)}$.

The first term is easy. Assume that the ac multiplication result is in d0. Lsl.l #4,d0 works OK, and is just about as fast as lsl.l d1,d0 where d1 holds a 4. The middle term is more complicated.

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Since both ad and bc must be divided by the same amount, we can add them together first. Assuming that the scale factor has been selected conservatively, an overflow should not be possible as a result of the addition. A look at the time table shows that shifts take times that vary with the amount of the shift, with the first few shifts taking proportionally longer. The right shift twelve can't be done by lsr.l #12,d0 because the maximum allowed shift is 8, but two lsr.l #6,d0 shifts do work. Alternatively, lsr.l d1,d0 works, assuming that d1 holds twelve, and this is faster, but a data register must be available to hold the 12.

Shifting bd 28 to the right is simple, just put 28 in d1 and do a lsr.l d1,d0. It's simple, but slow. Here is a faster way. First swap d0, then moveq #0,d1, then move.w d0,d1. This is the equivalent of lsr.l d0,d1, where d0 holds 16. You still need to shift another 12 to the right. All this is messier, but still faster than a shift of 28. Another way is to use the rotate instruction. What you really want when you divide by 2^{28} is to put the top four bits of the register in the bottom four positions and discard the rest. You could rotate 28 right, but the same result is obtained much faster by rotating left four, i.e., rol.l #4,d0. Now you need to get rid of the upper 28 bits, which is done by masking with the andi.l #15,d0 instruction. Of course, if you have a data register available with a 15 in it, and l dn,d0 is faster; in fact, even if you have to move a 15 into the register each time, it is still faster. Now that you have seen examples of use of the swap and rotate instructions to divide by 2^{28} , you will want to go back and see if these can be used to speed up the right shift twelve of the sum of ad and bc.

The discussion of multiplying two 32-bit numbers above has been done in piecemeal fashion, using d0 and d1 to illustrate. In actual practice, all the data registers, some address registers, and possibly some memory locations might be needed to hold intermediate results. It has been assumed that the multiplication would not result in a number too big to handle in one data register. Although the `mul`s instruction exists, it is easier to treat both numbers as unsigned and use a flag to keep track of the sign of the result. The following multiplication routine uses some—but not all—of the techniques discussed above. It can be improved. It assumes that the 32-bit numbers to be multiplied are in d4 and d5 and puts the result in d4. The numbers in registers d4 and d5 are assumed to have been scaled up by 2^{28} , so it will be necessary to divide the result by 2^{28} , which the routine does. All data registers are available, which will not always be the case, and all are used.

```

moveq    #12,d6    for dividing by 2^12
moveq    #0,d7      initialize flag
move.l   d4,d0
bpl.s    Plus1
moveq    #1,d7      found one negative number
neg.l    d0
Plus1    move.l     d5,d1
bpl.s    Plus2
addq.l   #1,d7      found another negative number
neg.l    d1
Plus2    move.w     d0,d4
mulu     d1,d4      multiply low words of d0 and d1
moveq    #0,d3
swap     d4
move.w   d4,d3
move.l   d3,d4      same as dividing d4 by 2^16
move.l   d0,d2
swap     d2
mulu     d1,d2      multiply high word of d0 and low of d1
move.l   d1,d3
swap     d3
mulu     d0,d3      multiply high word of d1 and low of d0
add.l    d3,d2      combine two high-low products
add.l    d2,d4      add in low-low, already shifted 16
lsl.l    d6,d4      shift all three right 12
swap     d0
swap     d1
mulu     d1,d0      multiply high words of both
lsl.l    #4,d0      multiply by 2^4
add.l    d0,d4      holds absolute value of product
cmpi.b   #1,d7      if exactly one negative number
bne.s    Plus3
neg.l    d4
Plus3    continue program

```

Clearly, how close this particular routine is to being optimum depends upon the remainder of the program. It can always be used “as is” by pushing needed registers on the stack before using it and popping them afterwards, but this is also a time-consuming process and must be balanced against alternative ways. Although the 68000 chip is relatively generous in the number of registers it provides, a few more would always be welcome, and any spare address registers should not be ignored. Saving data temporarily in address registers is faster than putting it in memory. For many purposes, address and data registers are interchangeable. One difference which can be overlooked with painful consequences is that if an address register is the destination of a move, condition code flags are not affected. Address registers make excellent counters, an exception being with the `dbra` instruction. If you have a couple of masks that you need to use with an `and` instruction, you might keep one of them in an

address register and the other in a data register and use the exchange instruction as needed.

There *must* be a single *best* way for you to write any specific program, but fortunately, you will probably never convince yourself that you have found it. I say “fortunately” because looking for better and faster alternatives is what makes all programming—and assembly language programming in particular—such an exciting challenge.

To conclude, here is my file of times for various instructions:

Time	Instruction	Remarks
195	<code>add.l d0,d0</code>	
195	<code>addq.l #1,dn</code>	
195	<code>addq.l #4,a5</code>	(same for <code>addq.w</code>)
195	<code>and.l d0,d1</code>	
392	<code>andi.l #65535,d0</code>	(zeros upper word of longint)
295	<code>bchg #17,d0</code>	(same for <code>bset</code>)
311	<code>bclr #17,d0</code>	
		<code>bcc.s</code> takes 276 when branch occurs, 197 when no branch.
		<code>bcc.w</code> takes 276 when branch occurs, 297 when no branch
		<code>bsr.s</code> (or <code>bsr.w</code>) and <code>rts</code> combined take 865
213	<code>btst #17,d0</code>	
116	<code>clr.l dn</code>	
475	<code>clr.b 0(a0,d0.w)</code>	
687	<code>cmpi.l #1,label</code>	
311	<code>cmpi.l #1,d0</code>	
115	<code>cmp.l a7,d0</code>	
195	<code>eor.l dn,dn</code>	
115	<code>exg a0,a1</code>	
99	<code>ext.l d0</code>	(same for <code>ext.w</code>)
213	<code>lsl.l #1,d0</code>	
293	<code>lsl.l #2,d0</code>	
310	<code>lsl.l #3,d0</code>	
585	<code>lsl.l #8,d0</code>	
		<code>lsl.l d0,d1</code> takes 391 for <code>d0=4</code> , 585 for <code>d0=8</code> 704 for <code>d0=11</code> , 1561 for <code>d0=28</code>
475	<code>move.b #0,0(a0,d0.w)</code>	
99	<code>move.l d0,d1</code>	
99	<code>move.l a0,d1</code>	
492	<code>move.l label,d0</code>	
393	<code>move.l label(pc),d0</code>	
297	<code>move.l d0,(a5)</code>	
394	<code>move.l -4(a5),d0</code>	
393	<code>move.l d0,4(a5)</code>	
	<code>move.l d0,-(a7)</code> and <code>move.l (a7)+,d0</code>	take 593 total.
99	<code>movea.l d0,a0</code>	
297	<code>movea.l #0,a0</code>	(use <code>suba.l an,an</code> to zero address registers)
	<code>movem.l d0/a0,-(a7)</code> and <code>movem.l (a7)+,d0/a0</code>	take 1281 total
	<code>movem.l d0/a0-a1,-(a7)</code> and <code>movem.l (a7)+,d0/a0-a1</code>	take 1670 total
	<code>movem.l d0-d7/a0-a7,-(a7)</code> and <code>movem.l (a7)+,d0-d7/a0-a7</code>	take 6780 total
99	<code>moveq #0,dn</code>	
1270	<code>mul.s #-37,d0</code>	
998	<code>mul.s #0,d0</code>	
998	<code>mul.s d0,d0</code>	
1074	<code>mulu #2,d0</code>	
115	<code>neg.l d0</code>	
99	<code>nop</code>	
214	<code>rol.l #1,d0</code>	
	<code>rol.l d1,d0</code>	605 for <code>d1=9</code> , 979 for <code>d1=16</code>
1561	<code>ror.l d1,d0</code>	where <code>d1=28</code>
99	<code>spl d0</code>	
475	<code>st #0,0(a0,d0.w)</code>	
195	<code>sub.l dn,dn</code>	
195	<code>suba.l a0,a0</code>	(sets <code>a0</code> to zero)
392	<code>subi.l #200,d0</code>	
195	<code>subq.l #4,a5</code>	
99	<code>swap d0</code>	
490	<code>tst.l label</code>	
99	<code>tst.l d0</code>	
374	<code>tst.b 0(a2,d5.w)</code>	
197	<code>tst.b (a2)+</code>	
197	<code>tst.b (a2)</code>	

•AC•

NOTES

From the C Group

by Stephen Kemp

A GOOD PRACTICE TO ADOPT is that of periodically taking your library reference manual down from the shelf for a leisurely study. Often, you will come across some useful item that you either missed, or simply didn't have time to absorb as you frantically searched for that single bit of information on a particular function.

It's easy to fall into the trap of not using all the resources you have on hand. Once you find something that works, why look for anything else? Because you might find something better! At the very least you will expand your working knowledge.

The last time I consulted my reference, I was in need of a function to convert a hexadecimal number stored as a string into the numerical equivalent. Most standard libraries have functions to convert ASCII strings into integers, floats, or reals like `atoi()`, `atof()`, `gcvt()`, etc. But in most cases these functions all assume that the "string of numbers" represents decimal digits and does not support hexadecimal values.

Now, I knew I could write the function with little effort, but why? If the "printf" family of functions can output hexadecimal values in a string, wouldn't there logically be a function to go the other way? So I pulled out the book and looked up the functions for converting formatted input—the `scanf()` family.

I knew that `scanf()` supported very similar format options to those supported by `printf()`, so it wasn't by complete chance that I began here. Basically, the two functions are direct opposites. However, I never quite realized just how much they have in common until I studied the two functions at the same time.

Listing One features a simple program that produces a hexadecimal dump of a file. You may find the output somewhat similar to that used by many debuggers to display data. It takes the following form:

Offset	Hexadecimal Values	Text Values
01000:	00 00 03 E9 00 00 0B 81 48 E7 7E FE 24 48 24 00H~.,\$\$.
01010:	49 F9 00 00 00 00 2C 78 00 04 47 F9 00 00 03 78	I.....,x..G....x
01020:	00 00 00 DE 25 6C 78 00 2D 4E 6F 20 66 69 6C 65%ix.-No file
01030:	20 6D 61 74 63 68 65 73 20 25 73 0D 0A 00 72 62	matches %s...rb
01040:	00 00 43 6F 75 6C 64 20 6E 6F 74 20 6F 70 65 6E	..Could not open

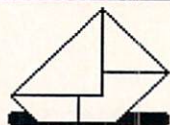
The first column contains the offset (in hex) within the file where the bytes that follow were read. Next appears the hexadecimal values for 16 bytes each separated by a space. Finally, the last column contains the text representation of the same 16 bytes bounded on both sides by the vertical lines.

•

**It's easy to
fall into the
trap of not
using all the
resources
you have on
hand...**

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Of course, not all byte values will produce a displayable character. Therefore, this program contains code to substitute periods in the text area for many characters. Only the values from 20H (the space) to 7EH (the tilde) are usually considered displayable in most environments, which is one of the reasons I selected to support this range. One additional reason for this decision is that many printers do not automatically support the same extended character set used by the Amiga's console.

This program contains many of the same "features" that are usually included in my sample programs. It should compile (unchanged) with either the Lattice or Manx compilers. (Note: I have yet to upgrade to the latest version of the Lattice compiler—now developed and marketed under SAS Institute—and still use Lattice 5.04.) Also, the program will support any number of command line parameters and filename parameters may contain wildcards. Lattice filename wildcards are the same as those supported by AmigaDOS; Manx supports the asterisk and question mark, common to the PC-DOS environment.

As an option, each file's name can be preceded by an offset from which to begin reading. It is necessary to use "-S=" to indicate the option. Of course, you could shorten the indicator, but this method helps to ensure that there is no conflict with the name of a file that may be on your disk. After

the equal sign, the offset value should appear. Offsets can be decimal or hexadecimal. Hex values should be preceded by "0x", like "-S=0x345A".

DUMP uses sscanf to convert any hex string values. Three parameters are required for our use of this function. First comes the input buffer which is taken from the command line argument list. Notice that a pointer is used to indicate where the hexadecimal string value actually begins.

The second parameter is the formatting option string. Since we are only interested in converting a single hex value, we have to use the "x" indicator. The "l" (long) indicator precedes the variable type to support larger offsets.

Finally, the function must be passed the address of a variable for each type that appears in the formatting argument. Since our formatting string contains only one type, there is only one address passed. It is the address of a long integer since we want to support larger values as indicated by the format option "%lx". There is one discrepancy to report between Manx and Lattice. I am accustomed to \ hex values with upper-case letters. Normally, this can be accomplished with Lattice by using a capital letter "X" in the format string. However, Manx apparently does not support this feature.

I hope the remainder of the program is self-explanatory. The input files are read, 16 bytes at a time, and the output formatted like that shown earlier. In order to keep the code simple, each byte's hex value is printed and a check is then made to determine whether the period character should be substituted for non-displayable characters.

This program is similar to one I have used for some time now to examine the structure of data files. If hex outputs are not something you are likely to need, then I hope the program has offered a few other ideas you might use.

Having worked a number of years in the computer industry, I have learned to take advantage of the resources available to me. Next time you're about to jump in and write a function to perform some little task and you find yourself thinking, "I shouldn't have to do this", you might want to pull out that manual for a little closer scrutiny. If it's going to take you a couple of hours to write the function anyway, what's an extra 20 minutes?

LISTING ONE

```
#if 0
```

```
Program: DUMP (DUMP.C)
```

```
Usage: DUMP [-S=offset] filename
```

```
Hex dumps a file to STDOUT with the printable ASCII  
on the right.
```

```
-S=offset can be used to specify an optional starting  
position within the specified file. This only applies to  
the file immediately following the switch. Hexadecimal  
offsets should be preceded by 0x like 0x4A5B. Values  
are assumed decimal if not prefixed as hexadecimal.
```



```

#endif

#include <stdio.h>

#ifdef LATTICE
#include <string.h>
#include <dos.h>
#define openmode "rb"
#else
#define strchr(a,b) index(a,b)
char *schr();
char *index();
FILE *fopen();
#define openmode "r"
#endif

#define TRUE 1
#define FALSE 0

#ifdef LATTICE
main(unsigned argc, char *argv[])
#else
main(argc, argv)
short argc;
char *argv[];
#endif
{
    char buf[17];
    unsigned n,i,cnt,x;
    char didone;
    unsigned long addr;
    FILE *fp;
    char *ptr;
    char *filename;

#ifdef LATTICE
    struct FILEINFO info;

    filename = info.fib_FileName; /* default name position */
#endif

    addr = 0L; /* No starting offset */
    didone = FALSE; /* haven't done anything yet */
    for (n = 1; n < argc; n++){ /* loop through all */
        if (argv[n][0] == '-'){ /* Check for starting offset */
            if (toupper(argv[n][1]) != 'S') continue; /* wrong */
            ptr = strchr(argv[n], '='); /* Check for equals */
            if (ptr){ /* if found */
                ptr++; /* get off equal sign */
                if (*ptr == '0' &&
                    toupper(*(ptr+1)) == 'X'){ /*if hex value */
                    ptr += 2; /* skip to number */
                    sscanf(ptr, "%lx", &addr); /* convert hex number */
                }
                else{
                    addr = atol(ptr); /* convert decimal number */
                }
            }
            continue;
        }
    }

#ifdef LATTICE
    if (dfind(&info, argv[n], 0) != 0){ /* check for file */
        printf("No file matches %s\r\n", argv[n]);
        addr = 0L; /* offset not valid now */
        continue;
    }
#endif

    for(i = 0; i++){ /* do all matches */

#ifdef LATTICE
        if (i != 0) /* if not first one */
            if (dnext(&info) != 0) break; /* end of chain */
#endif

        if ((filename=schr(argv[n])) == NULL) break; /* end */

        fp = fopen(filename, openmode); /* open file */

        if (fp == NULL){ /* did not open */
            printf("Could not open %s\r\n", filename);
            break;
        }

        printf("****%s****", filename); /* show file name */
        if (addr){ /* if a starting offset */
            printf("Start offset %ld or Hex %lx", addr, addr);
            if ((fseek(fp, addr, 0)) == -1L){
                printf("Invalid starting offset \r\n");
                break;
            }
        }
    }
}

```

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```

}
printf("\r\n"); /* end line */
didone = TRUE; /* actually did file */
while ((cnt = fread(buf, 1, 16, fp)) != 0){
    printf("%05lx: ", addr); /* hex address */
    ptr = buf; /* point at buffer */
    for (x = 0; x < cnt; x++, ptr++){ /* do all read */
        printf("%02x ", (unsigned char)*ptr); /* print hex */
        if (*ptr < 0x20 || *ptr > 0x7E) /* printable ? */
            *ptr = '.'; /* something to print */
    }
    for (x < 16; x++, ptr++){ /* pad out to length */
        printf(" "); /* just spaces */
        *ptr = ' '; /* now blanks */
    }
    printf(" |%.16s|\r\n", buf); /* print ASCII */
    addr += 16;
}
addr = 0L; /* no offset now */
fclose(fp); /* close file now */
printf("\r\n"); /* blanks between */
}

#ifdef LATTICE
if (i == 0) printf("No matches for %s\r\n", argv[n]);
#endif

addr = 0L; /* no offset now */

if (!didone){ /* if did nothing */
    printf("Usage: DUMP [-S=offset] filename ... \r\n \
        -S=offset = place to start dump \r\n \
        offsets are assumed decimal \r\n \
        hex values should be preceded by 0x \r\n \
        i.e. 0x5AC6 \r\n");
}
exit(0);
}

```

•AC•

Programming in AmigaBASIC: Conditionals

by Mike Morrison

Recursion, Iteration and Frenchmen

I must start this month's article by making an apology and a correction. In my last article (January '91, page 62) I made a joke about Frenchmen. I would like to apologize as this was an unfair and unprofessional comment, and has no place in an outstanding magazine like this (or any place else for that matter).

The other item that needs to be addressed in regards to that same article is my continuous use of the word "recursion" when what I in fact meant was iteration. (I received several letters regarding this oversight and must comment that I was quite impressed with the knowledge of our readers, and I think such proficiency bodes well for the future of the Amiga). Recursion is when a program or routine repeatedly calls itself. For an excellent explanation of recursive programming see Mark Pardue's article on page 16 of the Premier issue of *AC's TECH For The Commodore Amiga*.

Is it any wonder that at times I don't think I should be around sharp objects? In any event, I apologize if I offended or confused anyone. And to all of you who are saying that I should have known better on both counts, I say you are right and I promise to start sleeping at night.

On with conditionals

In the last two articles we talked about variables and iteration. In this article we will discuss conditionals. Conditionals allow our programs to make choices and decisions. We make decisions every day by evaluating a situation and then acting accordingly. If I am hungry, then I will eat breakfast. If I am not hungry, then I will go for a jog instead.

The IF/THEN statement

AmigaBASIC (AB) allows our programs to make decisions with the IF/THEN statement. With every IF/THEN statement

there is an expression. If the expression is TRUE, the THEN portion of the statement is executed. For example:

```
IF 5 > 3 THEN PRINT "True"
```

If you were to type this line in the output window of AB you would see the word "True" displayed once you pressed the return key. This is an example of using AB in immediate mode. That the results are executed immediately by AB is one of the nice things about writing programs with an interpreter type language.

The reason the word "True" is displayed is because the expression

```
5 > 3
```

is, in fact, true. Therefore, the THEN part of the IF/THEN statement is executed. If, on the other hand, you typed

```
IF 5 < 3 THEN PRINT "True"
```

and pressed return you would see nothing (actually, you would see "OK" which is AB telling you that it understood what you typed and that it has executed it). The reason nothing is printed is because the expression

```
5 < 3
```

is false and the THEN is therefore not executed.

Some examples

Try typing in a few of these "one-liners" and see if you can guess the results before pressing return.


```
IF 1 THEN PRINT "True"
```

What did you guess and why? If you recall, at the close of my last article I presented an example that looked like this:

```
WHILE 1
PRINT "Forever is a long time...."
WEND
```

This WHILE/WEND will loop forever and the above IF/THEN will print "True" for the same reason: AB and most languages consider 1 to be true.

```
IF 2=1 THEN PRINT "True"
```

```
IF 1=0 THEN PRINT "True"
```

```
IF "y" > "Y" THEN PRINT "True"
```

This example may require a little explaining. Computers represent letters with numbers internally. That is, each letter has a numeric value assigned to it. The Amiga uses ASCII (American Standard Code for Information Interchange). This is sort of a standard between personal computers (although there are other "standards" like EBCDIC which IBM mainframes use). An ASCII chart listing these values starts on page A-1 of the *AmigaBASIC* manual. You will also note that the value of a lower-case "y" is 121, while an upper-case "Y" has a value of 90 (you may have a little difficulty following the chart; it appears a bit garbled). This means that y is greater than Y because of its value. And a "Z" (122) is greater than an "A" (65). It seems backwards, but that's ASCII.

ELSE

An ELSE can also be added to an IF/THEN statement. The ELSE will be executed if the THEN isn't. In other words, the ELSE is executed if the expression is false. An example:

```
IF 3 > 5 THEN PRINT "3 is > 5" ELSE PRINT "3 is not > 5"
```

When you press return you will see:

```
3 is not > 5
```

"IF/THENs are the decision makers in your programs."

Here is a short example you can type in the list window. When you are done, run it:

```
INPUT "What month is it (1-12):";month
IF month = 1 then the.month$ = "January"
IF month = 2 then the.month$ = "February"
IF month = 3 then the.month$ = "March"
IF month = 4 then the.month$ = "April"
IF month = 5 then the.month$ = "May"
IF month = 6 then the.month$ = "June"
IF month = 7 then the.month$ = "July"
IF month = 8 then the.month$ = "August"
IF month = 9 then the.month$ = "September"
IF month = 10 then the.month$ = "October"
IF month = 11 then the.month$ = "November"
IF month = 12 then the.month$ = "December"
PRINT "It is "the.month$"
```

Block IF/THENs

There will be times when you will want to do more than one thing if an expression is true (or false). This is where block IF/THENs come in. Here is an example that will help explain block IFs:

```
INPUT "Enter your first name ";nam$
len.nam = LEN(nam$)
IF len.nam > 15 THEN
PRINT nam$ " is a long name."
PRINT "It has "len.nam" characters in it."
PRINT "It must take you quite a while to sign your name."
ELSEIF len.nam = 10 THEN
PRINT "Wow! "nam$ " has exactly 10 characters in it!"
ELSEIF len.nam < 10 THEN
PRINT nam$ " is a short name."
PRINT "It has "len.nam" characters in it."
ELSE
PRINT nam$ " must have between 11 and 15 characters in it."
PRINT "It has "len.nam$ " in it."
END IF
```

This program receives your name with the INPUT statement and then receives the length with the LEN function. I wanted to use NAME\$ for the variable that holds the name, but NAME is an AB reserved word (it's another command that renames a disk name), so we can't use it here. Once we have the length of your name in LEN.NAM we use a block IF to check different lengths.

If your name is longer than 15 characters then you will see:
"Jackerackermazoo is a long name.
It has 17 characters in it.
It must take you quite a while to sign your name."

If your name is comprised of exactly 10 characters, you will see:
"Wow! Jimmydavid has exactly 10 characters in it!"

If your name has less than 10 characters, you will see:
"Jay is a short name."

(continued on page 92)

AC'S

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("Conditionals", continued from page 89)

It has 3 characters in it."

And if your name has between 11 and 15 characters in it, you will see:

"Barbaralynn must have between 11 and 15 characters in it.

It has 11 in it."

The final ELSE will be executed only if all the other IFs are not. It is a catch-all. Once an expression triggers one of the IFs then the block of code associated with that IF is executed and the program then skips to the next statement after the END IF. This is why only one IF block will be executed. If none of the IFs are met, then the ELSE gets its chance.

Be careful when using block IFs (short for block IF/THENs). AB is mighty particular about structure. I indent each block within an IF because it shows you at a glance how the block IF is broken down (my preference). If you edit a block IF be sure there are no spaces after the THENs. Move the cursor there and be sure that it's up against the N in the THEN. If there are any spaces you will get a syntax error. This problem took me quite a while to figure out.

IF/GOTO

There is also an IF/GOTO in AB. You should try to avoid GOTOs if you want nice structured code. But here is an example if you want to see how it works:

```
start:
INPUT "Do you want to quit ";answer$
IF answer$ <> 'y' THEN GOTO start
PRINT "Done."
```

And THEN there was the END

IF/THENs are the decision makers in your programs. As soon as you become acquainted with them, you can write any program you wish. Block IFs can be tricky at first but, used in a structured manner, they can make your programs easier to write, read, and modify.

•AC•

The Fred Fish Collection

Due to the increasing size of the Fred Fish Collection, only the latest disks are represented here. For a complete list of all AC, AMICUS, and Fred Fish Disks, cataloged and cross-referenced for your convenience, please consult the current AC's Guide To The Commodore Amiga available at your local Amazing Dealer.

Fred Fish Disk 421	DMouse	A versatile screen & mouse blanker, auto window activator, mouse accelerator, pop, pop window to front, push window to back, etc. widget. This is DMouse version 1.25, an update to version 1.24 on disk 407. Includes source. Author: Matt Dillon
EZasm		Combines parts of the "C" language with 68000 assembly, giving it the "feel" of a higher level language. Supports all 1.3 functions. Uses braces and "else" like "C". Resulting code is optimized as much as possible. Takes source file you create and outputs a .asm file. Includes example source and executable files. Version 1.3, binary only. Author: Joe Siebenmann
NoVirus		Another Anti-Virus utility. This one features known and new virus detection, view boot block, save and restore bootblocks, several "install" options and more. Written in assembly. This is version 3.31, an update to version 1.56 on disk 180, and a limited demo of the commercial version. Binary only. Author: Nic Wilson
Zon		An arcade/adventure game that mixes a unique blend of puzzle solving and arcade adventure. Your mind and your reflexes will both be tested to their limits as you work your way towards your goal, recovering the Rings of Zon. Has 19 levels of action, save/restore your game on any level, stereo digitized soundtracks and sound effects, over 100 objects to discover and explore, up to 300 moving objects on the screen at once, and more. Volume 1, shareware, binary only. Author: George Broussard
Fred Fish Disk 422	Gravity	A program which simulates the movements of astronomical objects under the influence of gravity. For example, you can simulate the solar system or two stars circling around each other. Version 1.0, binary only. Author: Guido Burkard
Imploder		Allows you to reduce the size of executable files while letting them retain full functionality. Uses efficient algorithms (both time and space) as well as taking into full consideration the complexity of the Amiga environment. Very well done. Version 3.1, binary only. Author: Peter Strijk and Albert A. Brouwer
PopUpMenu		A small program that makes it possible for you to use pop-up menus with any program that uses standard intuition menus. Version 3.5, includes source. Author: Martin Adrian
SystemTracer		A tool to view and manipulate various AmigaDOS 1.2 and 1.3 system structures. Version 1.0, includes source. Author: Guido Burkard
TrackDOS		A program that allows easy transfer of data between DOS, memory and trackdisk device. DOS means the data contained within a file, memory means the data contained anywhere within the memory map and trackdisk device means data stored on a disk not accessible with DOS (eg. bootblocks special loader disks etc.). The transfer of data between these three areas is not normally easy or convenient. TrackDOS was written to overcome this. This is version 1.04, an update to the version on disk 365. Binary only. Author: Nic Wilson
TrekTrivia		Very nice mouse-driven trivia type program for Star Trek fans. Contains 100 questions with additional trivia disks available from the author. Includes selectable skill levels, a cheat mode, and 250K of digitized music. This is version 3.0, an update to version 2.0 on disk 252. Binary only, shareware. Author: George Broussard
Fred Fish Disk 423	Hollywood	An easy to play trivia game with such subjects as M*A*S*H, Star Trek (old and TNG), Indiana Jones, general television trivia, and more. Each topic contains fifty questions and a related picture. Each time you answer a question right, a small portion of the picture is added to the screen. Shareware, binary only. Author: Probably the prettiest looking four foundation (with memory) calculator ever written for the Amiga. Written in J-Form. Version 1.023, binary only. Author: Mike Haas
LCDCalc		Another of Eric's cute animations. This one has Pogo and crew trying to hold a conversation with the beautiful Miss Mam'selle. Author: Eric Schwartz
SetRamsey		A program that allows you to test the current settings of the RAMSEY ram controller chip on an Amiga 3000 under Kickstart 1.3 or 2.0, and change them if you wish. Useful for hardware debugging to control static column mode, burst mode, or change the refresh rate. Version 1.02, binary only. Author: Nic Wilson
Fred Fish Disk 424	AutoCLI	A PopCLI type replacement that works with Workbench 2.0. Also fixes the problem with PopCLI crashing the machine if used on a PAL Amiga to open a CLI window with a vertical size greater than 200 lines. Other features include an optional Function-key press with the qualifier to execute an SScript file. Version 1.88, and update to version 1.8 on disk 399, with more enhancements. Binary only. Author: Nic Wilson
MED		A music editor much like SoundTracker. A song consists of up to 50 blocks of music, which can be played in any order. Editing features include cut/paste/copy tracks or blocks, changing the vibrato, tempo, crescendo, and note volume. Other features include switching of the low-pass filter on or off on a per song basis, and a cute little animated pointer of a guy doing "jumping jacks" in time to the music! This is version 2.13, an update to version 2.00 on disk 349. Binary only. Author: Tejo Kinnunen
TurboTitle		A program created for the purpose of substituting Japanese Animation films and to create a standard Amiga subtitle format. Is perfectly suited for substituting any foreign film. Version 0.71, shareware, binary only. Author: Robert Jenkins
Fred Fish Disk 425	A-Gen	Demo version of a shareware genealogy database program. The PAL version has been distributed in Australia and England for some time. This NTSC demo version is complete except that it is limited to 600 persons/300 marriages, does not support a text-editor to add free-form reports to records and does not show Dig-view pictures from within the program. The color requester is not included as this entails adding a library file to libx, and is not really needed. A-Gen needs 1Mb of ram, and a printer/2nd disk drive are a big help. Version 3.10, binary only. Author: Mike Simpson
CheckBook		Checkbook account is a checkbook recording program intended to be used as a companion to a checkbook register, not a replacement. Offers a simple way of balancing checkbooks, tracking bank transactions, and recording budgeted transactions. Version 0.9, binary only. Author: Jeffrey Almsol
Downhill		A skiing arcade game. Ski skyr mountain, a dangerous, steep, downhill scary mountain with bonus flags to pick up, rocks, bushes, and branches to jump over, all while avoiding obstacles such as trees. The longer you stay up the faster you ski and the more points you get. Binary only, joystick required, works only under AmigaDOS 1.3. Author: David Alves
HeadGames		A "Shoot-Em-Up" game done with SEUCK game constructor, featuring digitized heads as enemies. Binary only. Author: Neil Sorenson
Fred Fish Disk 426	Comman	Extremely useful replacement for the standard console handler, provides line editing and command line histories. Completely transparent to any application program that uses CON: windows. This program is shareware, and well worth a donation to the author. This is version 1.3e, an update to version 1.3 on disk 165. Changes include updates for Workbench 2.0 console refresh and cut/paste, and improvements to window resizing. Binary only. Author: William Hawes
Metro		In METRO, you play the role of a city planner. Using limited funds, you must construct a mass-transit subway system capable of meeting the needs of your city. Build wisely and your system will be a success, but poor planning will lead to disaster and financial ruin. Shareware, binary only, source available from author. Author: Mark A. Thomas and David P. Townsend
RickParksArt		A collection of artwork from one of the leading Amiga artists. Includes "Bryon", "Clipper", "Einstein", "Falconer", "Lincoln", "Lion", "Mickey", "Norman", and "Slyme". Superb hand drawn images with lots of detail. Author: Rick Parks
Fred Fish Disk 427	BlackJack	A blackjack simulation program with the ability to simulate nearly any casino blackjack game in the world. Allows the use of the most popular playing strategies and modifications to them. Has color coded strategy tables to enhance the learning of the strategy. Tracks basic statistics such as number of hands played, bankroll limits, casino profitability and others. Allows from 1 to 7 players, including the computer. Has online help, a demo mode, and a special practice mode. Version 1.01, shareware, binary only. Author: Dan Cogliano
Chemesthetics		Chemesthetics is a program that draws molecules using the calotte model. This means that atoms are drawn as bowls. Using this model, even extremely dangerous molecules like dioxine look quite nice. Chemesthetics has a fully intuited user interface and pictures can be saved as IFF graphics files. Version 2.00, includes source. Author: Joerg Fenin / Metaworx
Cyrillic		Cyrillic (Russian) 12-point font. Author: Elaine and Timm Martin
STV		Simple text viewer with mouse and keyboard scrolling, text search, and hooks to be launched onto custom screens. Works great under both Workbench v1.3 and v2.0 and from the CLI or icon. Version 1.00a, includes full C source. Author: Timm Martin
Fred Fish Disk 428	BCMusic	A set of three original songs written and composed using the freely distributable MED v2.10 music editor. These songs do not require a separate player program because it is actually compiled in with the song. WB2.0 compatible. Binary only. Author: Brian C. Berg
Cyrolite		Four handy animation utilities from Cyrogenic Software. Includes an animation creation tool that allows you to combine selected pictures into a standard animation, an animation information tool that is used to extract certain information from a given animation, an animation combining tool that allows you to join two animations into a larger one, and an animation splitting tool that allows you to split one animation into two smaller ones. Binary only. Author: Cyrogenic Software
ShadowMaker		Demo version of an intuition based Font shadow generator. In seconds you can convert your favorite fonts into color fonts with professional video shadows built right in. This demo version is missing the characters "w", "x", "y", and "z". Binary only. Author: Stephen Lebars
Train		An electric train contraption set game simulation. Shareware, binary only, source available from author. Author: Dennis Saunders
WonderSound		Wondersound is an additive harmonic instrument design tool with a separate envelope design window and 16 relative harmonic strength and phase angle controls. Version 1.6, an update to version 1.4 on disk 407. Binary only. Author: Jeffrey Harrington
Fred Fish Disk 429	ATCopy	A program to copy files from the Amiga side of a system equipped with a PC/AT bridgeboard, to the PC side, using workalikes. Copies directly through the shared memory. Supports CLI and Workbench usage. This is version 2.1, an update to version 2.0 on disk 406. Shareware, binary only. Author: Peter Vorwerk
CLImax		A command like NewCLI or NewShell except that it creates a borderless CLI or Shell window on a custom screen. Now you can use the whole display just like a non-windowing computer. Requires ConMan 1.3 or newer. Release three, vastly improved over the first release on disk 424. Includes source. Author: Paul Kientz
Dr		Another alternative CLI directory lister command. This one features extreme optimization for speed, a variety of output formats, hiding of info files by default, and AmigaDOS pattern matching. It is pure (re)sidentable. It is intended to outperform all other directory listers. Includes the additional utilities ForEvery and Whichever. Release 1.2, includes source. Author: Paul Kientz
FixCLI		A tiny pure command which fixes problems with CLI's not created by our CLI processes. A new CLI or Shell created by such programs as PopCLI or DMouse gets no path and no current directory. FixCLI very quickly and efficiently gives a path to a CLI that does not have one (it looks for other processes that have valid paths) and sets the current directory as specified if none is already set. Put it in your S-Shell Startup script. Includes source. Author: Paul Kientz
MoveSYS		Reassigns SYS:, C:, S:, L:, LIBS:, DEVS:, and FONTS: to a new disk or directory in one step. Can be used from CLI or Workbench; just click it and shift-double click a disk or drawer icon. More flexible and robust than some other programs written for the same purpose. It's small and pure. Second release (the one on disk 224 worked from CLI only). Includes source. Author: Paul Kientz
RunBack		A very compact version of the popular utility for starting a CLI process in the background, without preventing the CLI window from closing. This version is pure and only 468 bytes long. Requires the NULL: device, which is included. Using NULL: makes it more flexible and robust than older RunBacks. Can optionally delay up to nine seconds after starting the command. Includes source in assembly. Author: Paul Kientz
Scrub		A floppy drive cleaning program which automatically detects which drive has a cleaner diskette in it. Spins it for thirty seconds while moving the heads around. Pure. Includes source. Author: Paul Kientz
Timer		The timer device made easy! Example of how to create both synchronous and asynchronous waits. Includes a sample C program, a detailed technical discussion, and modules that you can plug in to your C programs. Author: Timm Martin
Trippin		A Workbench game based on an old print-board game. The object is a race in which each move you make restricts your opponent's choice of countermoves. Features a computer opponent of adjustable toughness. Includes source. Author: Paul Kientz
Uedit-Staff		A variety of configuration material for Uedit. Includes stuff for remembering multiple chunks of deleted text, interfacing through Rexx with a terminal program, displaying matching " characters when you press ", expanding abbreviations into phrases as you type, easily shifting lines and blocks of text left or right, improvements to several existing Uedit features, and more. Author: Paul Kientz
V		A front-end to Commodore's More or some other text viewer that can be made resident. Can be used from Workbench, greatly reducing disk loading time because V is much smaller than More, which need not be loaded if it is resident. From CLI, causes More to create a new window, specified with an environment variable, rather than using the CLI window. V is itself residentable. Much improved since the version on disk 224, to which it is only distantly related. Includes source in assembly. Author: Paul Kientz
Fred Fish Disk 430	Lotto	Small lotto number selector with C source. Author: Timm Martin
Pointer		Use the SID sleepy pointer in your programs. Includes C source, a sample program, and modules that you can plug in to your C programs. Author: Timm Martin
SculptTools		Programs to create objects for use in Sculpt 4d. Includes Brush, 4d to convert IFF brushes to objects in full color with HAM and EHB support and wrap to various shapes (update to version on disk 361). Fractal, 4d to create fractal mountains with various coloring from brush, checkers or based on altitude, and Spiral, 4d to create a variety of objects based around tubes and helices. Binary only. Author: Bruce Thomson
SmartFields		SmartFields is a replacement for Intuition string gadgets. It allows you to incorporate into your Amiga C programs the powerful editing capabilities often found in mini-computers. Includes full C source and documentation. Author: Timm Martin
Fred Fish Disk 431	AS8Kex	Twelve examples demonstrating the use of Charlie Gibbs AS8K assembler. Over a quarter megabyte of assembly source code. Author: E. Lenz
AdvTemplates		A collection of PD spreadsheet templates for business and law, originally intended for Lotus 123 on IBM PCs. They have been transferred to the Amiga, loaded into Gold Disk's The Advantage, and saved as native Advantage files. Requires Advantage V1.1 or higher. Author: Amiga port by Michal Todorovic
CheetSheet		A compilation of cheats, hints, backdoors, helpful bugs, passwords, codes, solves, and walkthroughs for over 150 Amiga games. January 1991 edition. Author: Mark Strayer
EZasm		Combines parts of the "C" language with 68000 assembly, giving it the "feel" of a higher level language. Supports all 1.3 functions. Uses braces and "else" like "C". Resulting code is optimized as much as possible. Takes source file you create and outputs a .asm file. Includes example source and executable files. Version 1.31, an update to version 1.3 on disk 421. Binary only. Author: Joe Siebenmann
Fred Fish Disk 432	APALasm	A Programmable Array Logic (PAL) program based on an old MM Fortran IV program from the PAL Handbook. Second Edition and Third Edition by MMI. This Version (1.00) is completely rewritten for Fortran 77. The outputs produced are sent to separate files instead of the screen. There are plenty of example PAL files to test, inspect, or just to learn what PAL's are all about. The Fortran source is included with the instructions to compile using ACI Fortran version 2.3. Author: Bob Metzler
Badger		Reminder program for your startup sequence. Badger will open a window and display any important events that are due! Badger will mail you before you if there is nothing to report. Events are entered via menu and prompts. This is version 2.01e, an update to the version on disk 365, and includes many new features. Shareware, binary only. Author: George Kerber
Conquest		Lord of Conquest is a war game similar in concept to the board game Risk. You are the lord of an entire world, destined to rule the galaxy. Some worlds are virgin worlds, ready for you to colonize. Some worlds have natives who do not wish to accept your rule, these you must conquer for they will yield more valuable resources. As you claim the galaxy you will find you are not the only one extending your domain. This is a two player game, so be prepared to defend yourself and take what is yours! Version 1.2, binary only, shareware. Author: Michael Bryant
FifoDev		FIFO is like PIPE: but is based on file library rather than on its implementation. Fifo library is a general file library implementation that supports named files, writing to a file from a hardware exception, multiple readers on a file with each getting the same data stream, efficient reading, and authors or mail not bother you if there is nothing to report. Events are entered via menu and prompts. This is version 2.01e, an update to the version on disk 365, and includes many new features. Shareware, binary only. Author: George Kerber
Reader		A program to scan a word list to locate which words can be made from the letters given. Allows matching of words by length and by giving the letters known, ie. m..h for the word MATCH. Great for word games and crosswords. Results output to screen and a RAM: based file. The word list is in ascii and so can be edited if desired. New words can be added and it could be used for different languages if required. Supplied with over 24,000 words (mostly English spellings). Version 1.01, includes source. Author: Gary Brittain
SBackup		Programmer's utility to assist in maintaining old versions of source code. SBackup maintains 2-99 old versions in any location desired. Version 1.00a, binary only. Author: George Kerber
TMonth		TMonth will execute any program the first time it's executed each month. Very useful, for example, to execute the ATOM-CLOCK program to set your clock each month. Version 1.01, binary only. Author: George Kerber
Whence		Whence will locate any program file in your current path. Similar to the UNIX whence command. Version 1.0, binary only. Author: George Kerber
Fred Fish Disk 433	DisPrint	Prints labels for 3.5" disks, primarily for PD library disks. Label data files can be loaded into memory so labels for special disks are available without having to type anything in or without having to wait for AmigaDOS to read in the full directory. This is version 2.3.5, an update to version 2.3e on disk 411. Shareware, binary only. Author: Jan Gelseler
Gwin		GWIN or Graphics Window is an integrated collection of graphics routines callable from C. These routines make it easy to create sophisticated graphics programs in the C environment. One line calls you to a custom screen (ten types available), menu items, rectangles, text, circles, polygons, etc. GWIN is a two dimensional floating point graphics system with conversion between world and screen coordinates. GWIN includes built in clipping that may be turned off for speed. Use of color and XOR operations are greatly simplified. Many examples of the use of GWIN are included in an examples directory, including a linear graph program, geographic mapping program, SPICE 6.0 graphics post processor, and others. Extensive documentation is included. This is version 1.1, an update to version 1.0 on disk 322, recomplied to be compatible with MANX Aztec C Release 5. Author: Howard C. Anderson
SysInfo		A program which reports interesting information about the configuration of your machine, including some speed comparisons with other configurations, versions of the OS software, etc. Version 1.98, an update to version 1.94 on disk 420. Binary only. Author: Nic Wilson

Fred Fish Disk 434

Backup Backup and Restore allow you to backup any directory tree with optional compression, and later extract all or part of the tree. The protection, date, and file comment are saved with each file. This is version 2.06, an update to version 2.04 on disk 258. Includes source. Author: Matt Dillon

DynaCADD Part 1 of a two part demo distribution of DynaCADD from Ditek International. DynaCADD is a professional 2D and 3D CAD package. This demo is fully functional except for disabled save and export functions. Requires a system with 68020/68030 and a 68881/68882 math processor. This disk contains all the files necessary to recreate the DynaCADD demo disk number 1. The files for demo disk number 2 can be found on library disk number 435. This is version 1.84, binary only. Author: Ditek International

GMC A console handler with command line editing and function key support. GMC provides extended command line editing, function key assignment in four levels, extended command line history, online help for functions in the handler, and a config function. Also includes an output buffer (dump to printer and window), filename completion, script function, undo function, prompt browser, pathname in window title, close gadget for KS 2.0, etc. This is version 9.8, an update to version 9.6 on disk 398. Shareware, binary only. Author: Goetz Mueller

TypingTutor A simple typing tutor program which measures your typing speed and adjusts the level of difficulty accordingly. Shareware, binary only. Author: William Jordan

Fred Fish Disk 435

DeluxeBeeP A little program that uses the new SelfFunction call to play a sound sample of your choice whenever a program calls the Intuition DisplayBee routine. Includes source and instructions on how to install your own sounds. Author: Jan van den Baard

DynaCADD Part 2 of a two part demo distribution of DynaCADD from Ditek International. DynaCADD is a professional 2D and 3D CAD package. This demo is fully functional except for disabled save and export functions. Requires a system with 68020/68030 and a 68881/68882 math processor. This disk contains all the files necessary to recreate the DynaCADD demo disk number 2. The files for demo disk number 1 can be found on library disk number 434. This is version 1.84, binary only. Author: Ditek International

Labeler A label generation program for Epson compatible printers. Has both English and German versions. This is version 3.0, binary only, shareware, source available from author. Author: Siegfried Rings

Fred Fish Disk 436

AztecAp An Ap interface package fixed to work with Aztec C version 5.0. This is version 1.9, an update to the version on disk 376, and includes a number of bug fixes and a couple of new features (such as vsprintf-format) vsprintf-like Ap routines and fixes for Kickstart 2.0). Includes source in C and assembly language. Author: Olaf 'Olser' Barthel

BatchRequester A simple program which opens an Ap file requester and writes the result to an environment variable. Very useful if used in batchfiles. Version 1.1, source code in Oberon. Author: Christoph Teuber

Berserker Detects and eliminates viruses. Knows all popular viruses and their kin, including the new 'Centurion' and 'Traveling Jack' viruses. Comes with a resident handler which continually checks memory to prevent virus infection and a utility to fix programs corrupted by the 'Centurion' and 'Traveling Jack' viruses. Version 5.02, an update to the version on disk 355. Contains partial source in assembly. Author: Ralf Thanner

Input How to read keyboard input simply and quickly. Includes C source, a sample program, technical discussion, and programming modules that you can 'plug in' to your own C programs. Includes source. Author: Timm Martin

KeyMacro A keyboard macro program, configurable via a text file, that also supports hotkey program execution. You can map up to eight functions to each key, including key codes such as cursor keys, the return key, etc. Version 1.8, an update to version 1.5 on disk 398. Includes source. Author: Olaf 'Olser' Barthel

LHLib A shared reentrant Amiga runtime library featuring highly optimized assembly language versions of the LHaArc data compression/decompression routines. Compresses faster and more efficiently than any other currently available implementation of the LHaArc algorithm. Two example applications for data compression/decompression, an interface to the Amiga Oberon Compiler, and documentation how to use the library in your own programs are included. This is version 1.8, binary only. Authors: Holger P. Knebel and Olaf 'Olser' Barthel

MemGuard A program similar to MemWatch, which continually checks the low memory vector table for random trashing. Has been optimized and greatly enhanced to support the 68010, 68020, 68030, etc. microprocessors. Unlike MemWatch, MemGuard does not run as a dummy loop but rather as a low level interrupt routine which is capable of trapping memory trashing even before exec might know of it, and even while task switching is forbidden. Version IV, an update to version IIIa on disk 354, binary only. Author: Ralf Thanner

MMB With MMB, users of 3 button mice under WB 2.0 can use the middle mouse button as a shift key to do multiple selects. Binary only. Author: Garry Glendown

MT420d Printer driver for the Mannesmann Tally MT420d. Update to the old version on disk 164. Includes a new bug-fixes. Author: Sascha Wildner

Zoom A fast and efficient floppy disk archiving utility based on the data compression/decompression algorithms used by its library. Has an Intuition and a Shell interface, fully supports Kickstart 2.0, is able to add texts and notes to archived output files, knows 66 different bootblock viruses, includes a number of compression parameters (such as encryption of the output file) and a lot more. Version 3.10, binary only. Author: Olaf 'Olser' Barthel

Fred Fish Disk 437

CLWindow CLWindow allows you to manipulate the dimensions of a CLI window. It can be moved, enlarged, or shrunk. This is version 1.00. Includes source in assembly. Author: Roger Fischlin

Flo Very small program which replaces the left Amiga-N and M commands with screen and window flipping

commands. It's an excellent example of how to use PC-relative addressing within input handlers. Version 2.0, includes a technical discussion and source in C and assembly. Author: Mike Monaco and Timm Martin

FMouse A mouse pointer accelerator, similar to Matt Dillon's DMouse. Includes a screen blanker and 'hot keys'. This is version 1.01. Includes source in assembly. Author: Roger Fischlin

PatchCompiler A program to generate patches using a Pascal like language to describe what needs to be patched. This is version 1.0. Includes source in assembly. Author: Roger Fischlin

WaitAnyKey A CLI command which will wait until the user presses any key. Useful for batch files, to pause until any key is struck. Version 1.00, includes source in assembly. Author: Roger Fischlin

Fred Fish Disk 438
GadgetED A program for creating and editing intuition gadgets. Includes a palette editor, generation of either C or assembly source, and binary saving for later loading and editing. Version 2.0, includes source. Author: Jan van den Baard

MenuC A menu and gadget compiler. Takes a simple ascii file describing menus and gadgets and creates the appropriate IntuiText structures needed to actually create working menus and gadgets, in either C or assembly source. This is version 0.8, binary only. Author: Bruce Mackey

ToolLib A shared library containing 45 useful functions for all kinds of programs. There are functions for ports, sorting, gadgets, memory, string, directory and file handling, etc. Version 7.6, includes source. Author: Jan van den Baard

Fred Fish Disk 439
AIBB Amiga Intuition Based Benchmark is a program designed to test various aspects of CPU performance using a full intuition interface. Tests include 'WritePixel', 'Sieve', 'Sort', 'Savage', 'Chrystone', and 'Matrix'. Version 2.0, binary only. Author: LaMonte Koop

Curses A link library containing many of the terminal independent standard 'curses' functions. Designed primarily for those interested in porting UNIX screen based programs to the Amiga. Version 1.22, an update to version 1.10 on disk 391. Includes source and examples. Author: Simon John Raybould

DeluxeChanger Converts binary files to assembler, basic, or C source code data initialization statements. It is useful to add graphics or sound samples to programs as initialized data. Version 1.0, includes source in assembly. Author: Andreas Ropke

HDClick A program selector, typically installed in the startup sequence as the first command. Has user defined gadgets, a configuration file, a config function, and works with both NTSC and PAL systems. This is version 1.21, binary only. Author: Claude Mueller

MCUtils Various source modules for Benchmark Module 2. Includes ColorReq, an interface to the Dissidents color library; IFFLib, an interface to Christian Webers IFF library; and ARP, an interface to ARP V1.3. Author: Sascha Wildner

Fred Fish Disk 440
3DPlot A 3D function plotting program that does hidden line, solid, or contour plots of equations of the form Z=F(X,Y). You can scale the plot, set plot limits, change rotation, etc. Can save and load the plots themselves, as well as the data. Version 2.0, includes source. Author: Randy Finch

DMake Matt's version of the UNIX make utility. Features multiple dependencies, wildcard support, and more. This is version 1.0, an update to version 1.0 on disk 246, but now includes source. Author: Matt Dillon

MegaD Yet another disk utility program for the Amiga. This one allows an unlimited number of directories to be accessed simultaneously. Version 1.01, shareware, binary only. Author: John L. Jones

Fred Fish Disk 441
Deksid A disk and file hexadecimal editor. Useful for editing binary files. Version 1.10, shareware, binary only. Author: Christian Warren, Marc Dionne

DiskPrint Prints labels for 3.5" disks, primarily for PD library disks. Label data files can be loaded into memory to label for special disks are available without having to type anything in or without having to wait for AmigaDOS to read in the full directory. This is version 2.3.50, an update to version 2.3.5 on disk 433, and fixes a minor problem with some printers. Shareware, binary only. Author: Jan Gensler

Dme Version 1.42 of Matt's text editor. Dme is a simple WYSIWYG editor designed for programmers. It is not a WYSIWYG word processor in the traditional sense. Features include arbitrary key mapping, fast scrolling, title-line statistics multiple windows, and ability to copy windows. Update to version 1.38 on disk number 284, includes source. Author: Matt Dillon

Fred Fish Disk 442
ToolManager With ToolManager you can add your own programs to the tools menu of the 2.0 Workbench. Requires Workbench 2.0, Version 1.2, includes source. Author: Stefan B. UUCP

UUCP An implementation of uucp for the Amiga, including mail and news. This is Matt's version for the Amiga, based on William Loftus's Amiga UUCP 0.40 release with news code from his 0.50 release, and months of work by Matt to make fixes and add enhancements. This is version 1.080, an update to version 1.060 on disk 360, and consists of three parts. Parts 1 and 2 are on this disk, and part 3 is on disk 443. Includes source. Author: Various, major enhancements by Matt Dillon

Fred Fish Disk 443
DICE Dillon's Integrated C Environment. A C frontend, preprocessor, C compiler, assembler, linker, and support libraries. Features include ANSI compatibility, many code optimizations, and autoind routines (user routines called during startup before main is called). This is version 2.05.14, an update to version 2.02 on disk 359. Shareware, binary only. Author: Matthew Dillon

UUCP An implementation of uucp for the Amiga, including mail and news. This is Matt's version for the Amiga, based on William Loftus's Amiga UUCP 0.40 release with news code from his 0.50 release, and months of work by Matt to make fixes and add enhancements. This is version 1.080, an update to version 1.060 on disk 360, and consists of three parts. Parts 1 and 2 are on disk 442, and part 3 is on this disk. Includes source. Author: Various, major enhancements by Matt Dillon

Fred Fish Disk 444

ChinaChallenges A game similar to Shanghai or Mahjong. The goal is to remove all pieces of the pile, the so called Dragon, step by step. This dragon is composed of 120 different game pieces. You can always find four pieces displaying the same picture or chinese symbols. This is version II, an update to the version on disk 312. Changes include some bug fixes, unlimited undo, saving and loading of games, background music, title screen, etc. Binary only. Author: Dirk Hoffmann

EliteBSS An online message and file handling system. Features include a message base, private mail, file library, support for xmodem, ymodem, and zmodem, fully buffered serial IO routines for top speed, time limits, and more. Version V.31, binary only. Author: Nick Smith

MissileCmd A fast Missile Command game written in assembly. Features include using a hires interlaced screen, time based events for correct operation on any speed Amiga, multitasking friendly, and sound effects. Binary only. Author: Max Bithard

RegExLib Shared library that implements regular expression pattern matching. Version 1.0, binary only. Author: Stephen Moehle

UltraF4 Demo version of a super graphic based floppy format program that can format four floppy disks at the same time and even format disks that other programs give up on. Binary only. Author: Terry Bullard and Signa Bullard

Fred Fish Disk 445
MWTape A tape handler which uses scsi device to implement serial access to typical streaming tape devices. Includes source. Author: Markus Wandel

OptMouse A program which allows you to use a Mouse Systems M3 serial mouse on the Amiga and instructions which allow a serial mouse to be modified to plug directly into the Amiga mouse port. Useful as an example of how to 'take' mouse movements and may be of use in writing drivers for digitizers, light pens, and the like. Includes source. Author: Ed Hanway

Tar A port of a UNIX tar clone that can work with the TAPE: handler (also on this disk) to read and write UNIX tar compatible tapes. Includes source. Author: John Gilmore, FSF, Jonathan Hue, et al.

TurboText An almost fully operational demonstration copy of a new sophisticated text editor for the Amiga. Features many unique capabilities including an impressive ARexx interface with over 140 commands available, full outlining abilities, clipboard support, complete reconfigurability, recorded macros, programmer's calculator, emulations of many popular text editors, and much more. This demo version does not allow saving or printing of documents and limits the size of cut and paste operations. Version 1.0, binary only. Author: Martin Taillefer

UUCP A bug fix for UUCP 1.08 released on disks 442 and 443, which had already been finalized at the time this fix reached me so could not be included there. Fixes a serious bug in uucop. Author: Matt Dillon

Fred Fish Disk 446
CanonBJ A printer driver for the Canon BJ series of printers. Faster and supports more graphic and text modes than the standard Commodore driver. Shareware, binary only. Author: Wolf Faust

GamePort A toolkit with link time and shared libraries that allow easy access to the GamePort device. Includes examples and test programs. Version 1.1, binary only. Author: Paris Bingham

Input A toolkit with link time and shared libraries that allow easy access to the Input device. Includes examples and test programs. Version 1.1, binary only. Author: Paris Bingham

PointerLib A disk based shared library which provides programmers with easy access to custom pointers and a consistent user selected busy pointer. Includes source. Author: Luke Wood

Post An excellent PostScript interpreter for the Amiga which implements the full Adobe language. Supports type 1 and type 3 fonts, screen output, file output, and printer output. Requires Ap library V39+ and ConMan V1.3+. This is version 1.4, an update to version 1.3 on disk 408. Includes source in C. Author: Adrian Aylward

Fred Fish Disk 447
AmiBack Demo version of a new backup utility. Features include backup to any AmigaDOS compatible device (such as floppies, removable hard disks, fixed media hard disks, and tape drives), no copy protection, configuration files, complete backups, incremental backups, selective backups, file exclusion filter, setting of archive bit, etc. Demo version does not have restore, compare, or scheduler. Version 1.0, binary only, requires AmigaDOS 2.0. Author: MoonLighter Software

BackPac Demo version of a new backup program. Features include intuition interface, data compression, 907K written per floppy, full and incremental backups, full or selected restores, inclusion/exclusion patterns, user defined config files, multitasking friendly. Version 1.3, binary only. Author: Canadian Protocol Replicas

DFC Disk Format and Copy program. A nice, general purpose, disk formatter and copier. This is version 5, an update to the version on disk 131. Includes source. Author: Tom Rokiki and Sebastiano Vigna

FlashBack Demo version of a new backup utility. Fully functional version for the restore operation. Features include backup of multiple partitions in one pass, backup of non-AmigaDOS partitions, backup to a file, automated unattended backups, pattern matching, and streaming tape support. Version 2.05, binary only. Author: Leon Franklin, Advanced Storage Systems

SMan A Mandrelbit generation program. Uses the mouse to select regions within borders of the Mandrelbit set to zoom up to magnifications of 10x19. Includes math coprocessor support and options to save images as an IFF file. Shows example of assembly programming of extended precision for the 68881. Includes source. Author: David McKinstry

TCL Port of Tool Command Language, a simple textual language intended primarily for issuing commands to interactive programs such as text editors, debuggers, illustrators, shells, etc. It has a simple syntax and is programmable so TCL users can write command procedures to provide more powerful commands than those in the built in set. Alpha 2 version, binary only. Author: Dr. John Ousterhout, Amiga port by Hackercorp

Fred Fish Disk 448

AmigaPet Another cute screen hack. Version 2.52b, binary only, source available from author. Author: Patrick Evans

FifoDev FIFO is like PIPE: but is based on the library rather than its own implementation. FIFO library is a general file library implementation that supports named files, writing to a file from a hardware exception, multiple readers on a file with each getting the same data stream, efficient reading, and automatic or manual flow control. Programs that require non-blocking IO can access one side of a FIFO: connection via the fifo library instead of the FIFO: device. Version 2, an update to version on disk 432. Includes source. Author: Matt Dillon

Mkid A program identifier database package that provides a logical extension to 'ctags'. The ID facility stores the locations for all uses of identifiers, preprocessor names, and numbers (in decimal, octal, or hex). Includes source. Author: Greg McGary, Amiga port by Randall Jesup

NightMare A handy little program that uses 'shock' techniques to scare people. Fun to watch while someone else is using your computer. Version 1.0, binary only, source available from author. Author: Patrick Evans

OnTime Holds up a task until a given time and then releases it to run. Version 1.0a, binary only, source available from author. Author: Patrick Evans

PicToANSI Converts a one bit plane 320x200 IFF picture to a file that displays the picture on any ANSI compatible terminal. Binary only, source available from author. Author: Patrick Evans

SolitaireX A solitaire game. Features include all possible moves shown with a pulsing green box around the card, reshuffle, unlimited undo, and tournament mode. Binary only. Author: Stephen Orr, Gregory M. Steinback

ST2Amiga A program to convert Atari ST format relocatable executables to Amiga format relocatable executables, for subsequent loading into the ReSource disassembler and conversion to Amiga. ST2Amiga should also compile and run on an ST. Version 1.1, includes C source. Author: David Campbell

Swish A small simple screen hack that pushes the screen around using the view port, and simulates a floating motion. Binary only, source available from author. Author: Patrick Evans

Fred Fish Disk 449
Globulus Demo version of a new arcade game that is reminiscent of the old Q-Bert game. You control a cute little character and hop him around pathways in a diagonal kind of world, while trying to avoid bad things and catch good things. Binary only. Author: Interprise

Handshake A full featured VT52/VT100/VT102/VT220 terminal emulator. The author has taken great pains to support the full VT102 spec. Supports ANSI colors, screen capture, XPP external protocols, user selectable fonts, APress, and more. This is version 2.02c, an update to version 2.12a on disk number 172. Binary only, shareware. Author: Eric Haberleiner

Hz2ansi Turns any two color low-res IFF picture into ANSI text that can be displayed on any ANSI compatible terminal. This is version 0.1, includes source in assembly. Author: CammoreBeerMacht

Shazam A picture viewer for Dynamic Hires images created with MacroPaint, the 4096 color high resolution paint program from Lake Forest Logic. Version 1.1, includes two sample Dynamic Hires images and source for display program. Author: Lake Forest Logic

WonderSound WonderSound is an additive harmonic instrument design tool with a separate envelope design window and 16 relative harmonic strength and phase angle controls. Version 1.7, an update to version 1.6 on disk 428. Binary only. Author: Jeffrey Harrington

Fred Fish Disk 450
AmyVsWalker Another cute animation from Eric Schwartz. This one has Amy the Sourcel attempting to take a wrench to the 'A' Walker from 'The Empire Strikes Back'. Author: Eric Schwartz

MrRexx A simple ARexx interface which can be easily patched into almost any program. Includes an example the feedraw program from disk number 1. This is version 0.4, an update to the version on disk 138. Includes source. Author: Tomas Rokiki

Tabu Quarter inch cartridge (QIC) tape backup utility. Works with Microbotics HardFrame. May work with other controllers as well (untested). Includes source. Author: Roy C. Sigby

UUCP A bug fix for UUCP 1.08 released on disks 442 and 443, which had already been finalized at the time this fix reached me so could not be included there. Includes a new getty and some bug fixes. Author: Matt Dillon

To Be Continued.....
In Conclusion

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ISLAND was founded by Ira Miller, John S. Pade, and Rebecca L. Nelson. Their wide range of skills and experiences makes ISLAND a real tool for those interested in video production.

ISLAND
Ira Miller
86 Ayers Ct., #3A
Teaneck, NJ 07666
(201) 837-4611

PRESENTATIONS

SCALA, Digital Vision, Ltd.'s presentation program, is making its debut here in the United States. Released in Europe only recently, SCALA is now available in an NTSC version, and will be distributed by Great Valley Products. The venture marks GVP's first support of a software package.



Text placed over the included "Fabric" background image.

The SCALA package comes equipped with features that allow users to produce eye-catching presentations. The easy-to-use interface, along with just three main menus, makes learning SCALA a snap. Choose from the many backdrop images and textures, such as "Stone", "Marble" and "Fabric", to liven up your

presentations. Special transitional effects allow you to perform fades, wipes, blinds, etc. with images. SCALA will let you import images from your favorite animation programs and add them to your display.

And let's not forget about text. SCALA supports both serif and sans-serif fonts, along with different weights and sizes. Apply any of the supplied text styles (Bold, Drop Shadow, 3-D effects, etc.). You can also import text from other word processors.

Included with SCALA is ScalaPrint, a program that allows users to make hard copies of a presentation. Many color and black & white printers are supported, as well as PostScript. To run SCALA, Kickstart 1.2 or higher and at least 1MB of memory are required.

SCALA
Price: \$395.00
distributed by Great Valley Products
600 Clark Avenue
King of Prussia, PA 19406
Inquiry #232

COMMODORE

Commodore announces on-site service for professional systems



Effective March 1, 1991, Commodore Business Machines will activate a new program for customers who purchase an Amiga 2000, 2000HD, 2500, or 3000-series system. CBM will provide

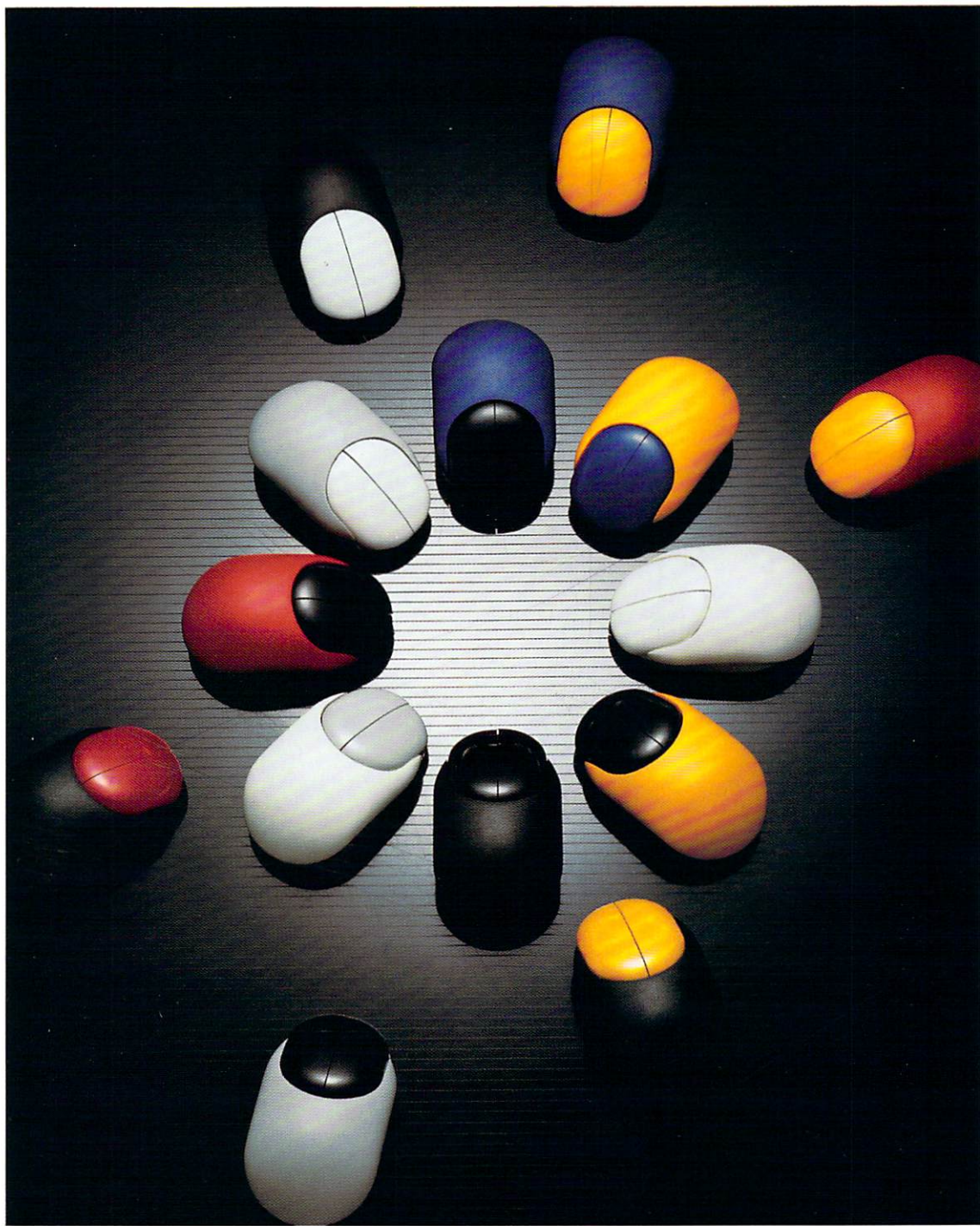
free, on-site "Gold Service" for one year to customers who purchase one of these professional systems and send their activation cards and proof of purchase to Commodore Business Machines. The program, available in all 50 states, will begin with purchases made on or after February 1, 1991.

Amiga 500 owners have enjoyed for some time a special CommodoreExpress service. Under the CommodoreExpress plan, Amiga 500 owners have been able to phone for assistance and technical help, as well as receive express service on repairs, through an 800 number. Now one call to CBM's Technical Support 800 number will provide complete service and support to both professional and consumer users.

The program is designed to be completely transparent to the Amiga user. All Amiga owners will contact one 800 number for support. CBM will either solve the problem over the phone, or begin either on-site service or the CommodoreExpress service depending on which plan is required.

With this plan, CBM has become the largest consumer and professional computer company to offer on-site or direct service free to customers. While similar plans exist in some part through IBM-clone manufacturers, neither Apple Computer nor IBM have offered their customers this level of support.

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